UNIVERSAL CYCLOPÆDIA AND ATLAS

VOLUME III

UNIVERSAL CYCLOPÆDIA AND ATLAS

A NEW EDITION UNDER DIRECTION OF

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PRESIDENT OF THE UNIVERSITY OF WISCONSIN

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VOLUME III

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MAPS IN VOL. III.

POLITICAL.

PHYSICAL.

CITY.

PLATES.

PECULIAR PHONETIC SYMBOLS

USED IN THE WRITING OR TRANSLITERATION OF THE DIFFERENT LANGUAGES.

ā, ē, etc.: long vowels; in the Scandinavian languages the accent (*á*, *é*, etc.) is used to denote length.

ą: a nasalized *a*; so used in the transliteration of the Iranian languages.

å: labialized guttural *a* in Swedish.

æ: open *a* of Eng. *hat*, used chiefly in O. Eng.

aí: used in Gothic to denote *e* (open), in distinction from *ái*, the true diphthong.

aú: used in Gothic to denote *o* (open), in distinction from *áu*, the true diphthong.

bh: in Sanskrit a voiced labial aspirate (cf. *ch*).

ƀ: voiced bilabial (or labio-dental?) spirant, used in discussions of Teutonic dialects.

ç: voiceless palatal sibilant, similar to Eng. *sh*, used especially in transliteration of Sanskrit.

č: frequently used, e. g. in Slavonic languages, to denote the sound of Eng. *ch* in *cheek*.

c: voiceless palatal explosive, commonly used in transliteration of Sanskrit and the Iranian languages.

ch: as used in the transliteration of Sanskrit, a voiceless palatal aspirate, an aspirate being an explosive with excess of breath; as used in German grammar, the symbol for a voiceless palatal or guttural spirant.

dh: voiced dental aspirate (cf. *ch*) in Sanskrit.

ḍ: voiced cerebral explosive, so used in transliteration of Sanskrit.

ḍh: voiced cerebral aspirate (cf. *ch*) in Sanskrit.

đ: voiced dental (interdental) spirant, equivalent to Eng. *th* in *then*; so used in the Teutonic and Iranian languages and in phonetic writing.

ĕ: a short open *e*, used in Teutonic grammar, particularly in writing O. H. G.

ə: the short indefinite or "obscure" vowel of Eng. *gardener*; used in the reconstruction of Indo-Eur. forms, and in transliterating the Iranian languages.

gh: in Sanskrit a voiced guttural aspirate (cf. *ch*).

ǥ: voiced velar (back-guttural) explosive, used most frequently in Indo-Eur. reconstructions.

ȝ: voiced guttural (or palatal) spirant. equivalent to Mod. Greek γ, and used in transliteration of Iranian languages and O. Eng.

ḥ: a voiceless breathing, the Sanskrit *visarga*.

hv: a labialized *h*, similar to *wh* in Eng. *what*; used in transliteration of Gothic and the Iranian languages.

ḫ: voiceless guttural (or palatal) spirant, equivalent to German *ch*, and used in transliteration of the Iranian languages.

i̯: the semi-vowel *y*, or consonant form of *i*; used in phonetic writing and reconstructions of Indo-Eur. forms.

j: in the transliteration of Sanskrit and the Iranian languages a voiced palatal explosive; in the Teutonic languages a semi-vowel (= *y*), for which in Indo-Eur. reconstructions *i* is generally used.

jh: in Sanskrit a voiced palatal aspirate (cf. *ch*).

kh: in Sanskrit a voiceless guttural aspirate (cf. *ch*).

ł: the guttural ("thick" or "deep") of the Slavonic and some of the Scandinavian languages.

l̥: vowel *l*; used in transliterating Sanskrit, in reconstructing Indo-Eur. forms, and in other phonetic writing.

n̥: nasal vowel; used in reconstruction of Indo-Eur. forms and in phonetic writing.

ṇ: in Sanskrit the cerebral nasal.

ñ: in Sanskrit the guttural nasal (see following).

ŋ: the guttural nasal, equivalent to Eng. *n* in *longer*; used in transliteration of Iranian languages.

ñ: palatal nasal, similar to *gn* in Fr. *regner*; used in transliterating Sanskrit and in phonetic writing.

ö: palatalized *o*; used in German and in phonetic writing.

ǫ: short open *o* in Scandinavian.

ø: short palatalized *o* (ö) in Scandinavian.

ph: in Sanskrit, voiceless labial aspirate (cf. *ch*).

ɋ: voiceless velar (back-guttural) explosive; used in reconstructions of Indo-Eur. forms and in other phonetic writing.

r̥: vowel *r*; used in transliterating Sanskrit, in reconstructions of Indo-Eur. forms, and in other phonetic writing.

š: voiceless cerebral sibilant, equivalent to Eng. *sh*; used in transliterating the Iranian languages and in phonetic writing.

ṣ: voiceless cerebral spirant; used in transliterating Sanskrit.

th: in Sanskrit a voiceless dental aspirate (cf. *ch*).

ṭh: in Sanskrit a voiceless cerebral aspirate (cf. *ch*).

ṭ: in Sanskrit a voiceless cerebral explosive.

ţ: a form of dental spirant used in transliterating the Iranian languages (represented in Justi's transliteration by ṭ).

þ: voiceless dental (interdental) spirant, equivalent to Eng. *th* in *thin*; used in Teutonic dialects and in phonetic writing.

u̯: consonant form of *u*; used in phonetic writing.

ž: voiced cerebral sibilant, equivalent to *s* in Eng. *pleasure*, and to *j* in Fr. *jardin*; used in Iranian, Slavonic, and in phonetic writing.

ʒ: a symbol frequently used in the writing of O. H. G. to indicate a voiced dental sibilant (Eng. *z*), in distinction from *z* as sign of the affricata (*ts*).

EXPLANATION OF THE SIGNS AND ABBREVIATIONS USED IN THE ETYMOLOGIES.

>, yielding by descent, i. e. under the operation of phonetic law.
<, descended from.
=, borrowed without change from.
: , cognate with.
+, a sign joining the constituent elements of a compound.
*, a sign appended to a word the existence of which is *inferred*.

ablat.	ablative
accus.	accusative
adjec.	adjective
adv.	adverb
cf.	compare
conjunc.	conjunction
deriv. of	derivative of
dimin.	diminutive
fem.	feminine
genit.	genitive
imper.	imperative
impf.	imperfect
indic.	indicative
infin.	infinitive
masc.	masculine
nomin.	nominative
partic.	participle
perf.	perfect
plur.	plural
prep.	preposition
pres.	present
pron.	pronoun
sc.	scilicet, supply
sing.	singular
subst.	substantive
vocat.	vocative

Anglo-Fr.	Anglo-French
Arab.	Arabic
Avest.	Avestan
Dan.	Danish
Eng.	English
Fr.	French
Germ.	German
Goth.	Gothic
Gr.	Greek
Heb.	Hebrew
Icel.	Icelandic
Ital.	Italian
Lat.	Latin
Lith.	Lithuanian
Mediæv. Lat.	Mediæval Latin
Mod. Lat.	Modern Latin
M. Eng.	Middle English
M. H. Germ.	Middle High German
O. Bulg.	Old Bulgarian (= Church Slavonic)
O. Eng.	Old English (= Anglo-Saxon)
O. Fr.	Old French
O. Fris.	Old Frisian
O. H. Germ.	Old High German
O. N.	Old Norse
O. Sax.	Old Saxon
Pers.	Persian
Portug.	Portuguese
Prov.	Provençal
Sanskr.	Sanskrit
Sc.	Scotch
Span.	Spanish
Swed.	Swedish
Teuton.	Teutonic

KEY TO THE PRONUNCIATION.

aa..... as *a* in *father*, and in the second syllable of *armada*.

ăa..... same, but less prolonged, as in the initial syllable of *armada*, *Arditi*, etc.

a..... as final *a* in *armada*, *peninsula*, etc.

ă..... as *a* in *fat*, and *i* in French *fin*.

ay or ā.. as *ay* in *nay*, or as *a* in *fate*.

ăy or *ā*.. same, but less prolonged.

ã..... as *a* in *welfare*.

aw..... as *a* in *fall*, *all*.

ee..... as in *meet*, or as *i* in *machine*.

ĕe..... same, but less prolonged, as final *i* in *Arditi*.

e..... as in *men*, *pet*.

e..... obscure *e*, as in *Bigelow*, and final *e* in *Heine*.

ê..... as in *her*, and *eu* in Freneh *-eur*.

i..... as in *it*, *sin*.

ī..... as in *five*, *swine*.

ĭ..... same, but less prolonged.

ō..... as in *mole*, *sober*.

ō..... same, but less prolonged, as in *sobriety*.

o..... as in *on*, *not*, *pot*.

oo..... as in *fool*, or as *u* in *rule*.

o͝o..... as in *book*, or as *u* in *put*, *pull*.

oi..... as in *noise*, and *oy* in *boy*, or as *eu* in German *Beust*.

ow..... as in *now*, and as *au* in German *haus*.

ö..... as in *Göthe*, and as *eu* in French *neuf*, *Chintreuil*.

ŭ..... as in *but*, *hub*.

ŭ..... obscure *o*, as final *o* in *Compton*.

ü..... as in German *süd*, and as *u* in French *Buzançais*, *vu*.

y or *l*.... see *l* or y.

yu..... as *u* in *mule*.

yŭ..... same, but less prolonged, as in *singular*.

ch..... as in German *ich*.

g..... as in *get*, *give* (never as in gist, congest).

hw..... as *wh* in *which*.

*k*h..... as *ch* in German *nacht*, *g* in German *tag*, *ch* in Scoteh *loch*, and *j* in Spanish *Badajos*, etc.

ṅ..... nasal *n*, as in French *fin*, *Bourbon*, and nasal *m*, as in French *nom*, Portuguese *Sam*.

ñ or n-y.. Spanish *ñ*, as in *cañon*, *piñon*, Freneh and Italian *gn*, etc., as in *Boulogne*.

l or y.... Freneh *l*, liquid or mouillé, as (-i)ll- in Freneh *Baudrillart*, and (*-i*)*l* in *Chintreuil*.

th..... as in *thin*.

th..... as in *though*, *them*, *mother*.

v..... as *w* in German *zwei*, and *b* in Spanish *Cordoba*.

sh..... as in *shine*.

zh..... as *s* in pleasure, and *j* in French *jour*.

All other letters are used with their ordinary English values.

NOTE.

The values of most of the signs used in the above Key are plainly shown by the examples given. But those of ö, ü, *ch*, *k*h, ñ, and *v*, whieh have no equivalents in English, ean not be suffieiently indicated without a brief explanation, which is here given.

ö. The sound represented by this symbol is approximately that of -u- in *hurt* or -e- in *her*, but is materially different from either. It is properly pronounced with the tongue in the position it has when ā is uttered and with the lips in the position assumed in uttering ō.

ü. This vowel is produced with the lips rounded as in uttering oo and with the tongue in the position required in uttering ee, into whieh sound it is most naturally eorrupted.

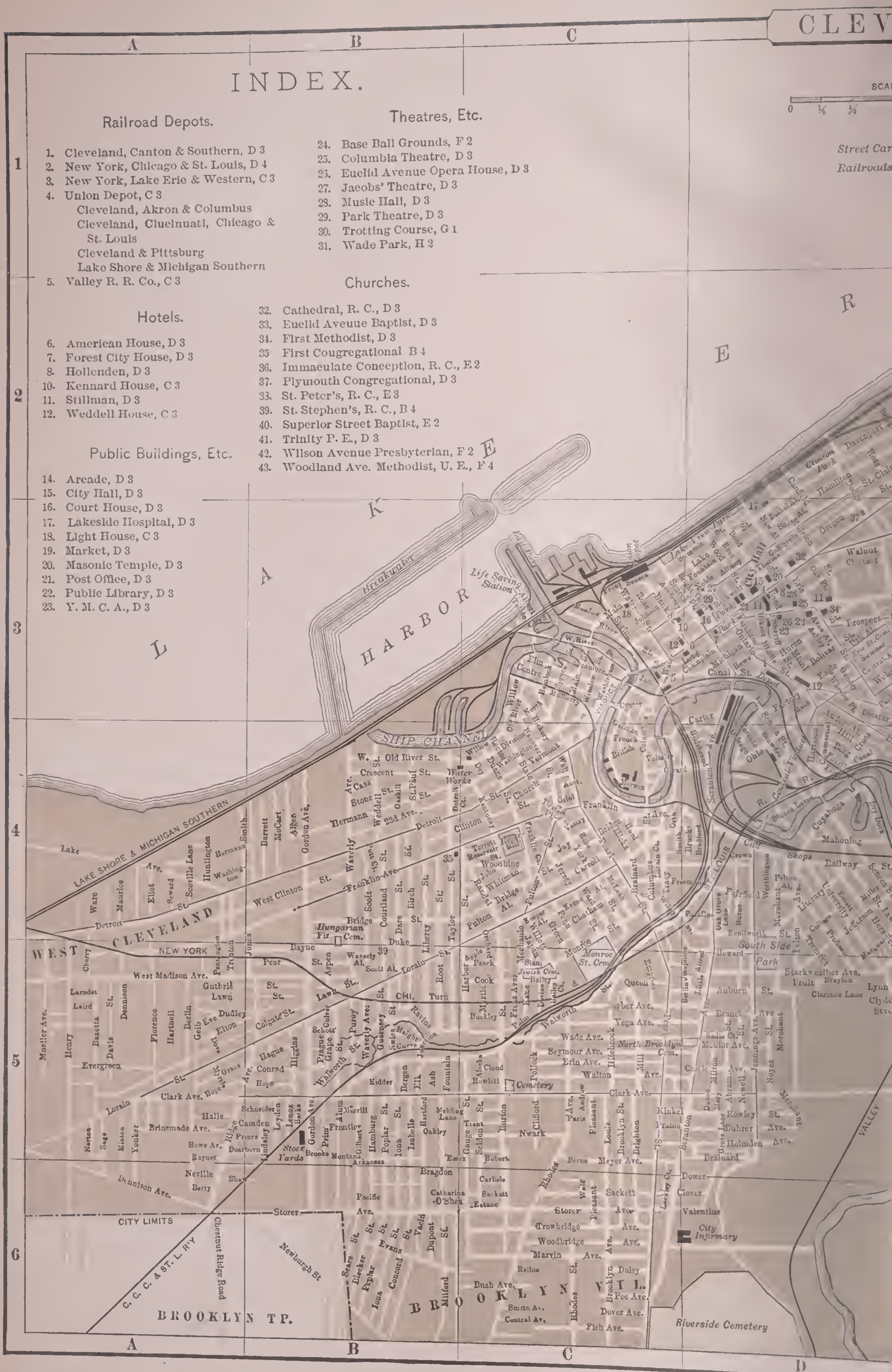
ch and *k*h. These are both rough breathings or spirants made with considerable force, *ch* being made between the flat of the tongue and the hard palate, and *k*h between the tongue and the soft palate. *ch* approaches in sound to English sh, but is less sibilant and is made further back in the mouth; *k*h is a guttural and has a hawking sound.

l or y. These are both used to represent the sound of French l mouillé, in (-i)ll- and (-i)l, whieh resembles English -y- in *lawyer*. Final *l*, that is, (-i)l, may be approximated by starting to pronounce lawyer and stopping abruptly with the -y-.

ñ or n-y. The consonants represented by ñ (Spanish ñ, Freneh and Italian gn, etc.) are practieally equivalent to English -ni- or -ny- in bunion, bunyon, onion, etc., and, exeept when final, are represented by n-y. Final ñ, as French -gn(e), may be produced by omitting the sound of -on in the pronunciation of *onion*.

v. This may be pronounced by attempting to utter English v with the use of the lips alone.

See PREFACE (vol. i., p. xli.) and the artiele PRONUNCIATION OF FOREIGN NAMES.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THE
UNIVERSAL CYCLOPÆDIA.

Cleveland: city; capital of Cuyahoga co., O. (see map of Ohio, ref. 2–H); on both sides of the Cuyahoga river, where it empties into Lake Erie; 138 miles by rail N. E. from Columbus, the State capital, 255 miles from Cincinnati, 183 miles from Buffalo, and 343 from Chicago. The Court House on the Public Square is in N. lat. 41° 30′ 5″, W. lon. 81° 42′ 6″. The city has an area of 33 sq. miles. The site of Cleveland is a plateau, sloping gently from the high bank of the lake to an elevation of from 50 to 150 feet. This plain is cut into two unequal divisions, the larger lying on the E., by the Cuyahoga, which receives Walworth Run from the W. about 1½ miles above its mouth, and Kingsbury Run from the E. a mile farther up in a direct line. The river flows through bottom lands half a mile in width, known as the "flats." A score of bridges span the Cuyahoga within the city limits, and three great viaducts, crossing the entire valley at an elevation, unite the east, west, and south divisions of the city. The Cuyahoga river was the original harbor, and it still affords space along its banks, within the city limits, for 16 miles of lateral docks. In the lake outside the U. S. Government has inclosed a space of 400 acres within a breakwater which begins about a mile W. of the river-mouth, extends some 3,000 feet into the lake, turns E. and runs 4,000 feet to a point opposite the river-mouth, leaves an entrance of 500 feet, then begins again and continues easterly 4,000 feet.

Streets, Parks, and Buildings.—The commercial part of the city extends eastward from the lower reaches of the river, parallel with the lake-front, for about a mile. Its principal thoroughfares are Superior Street, 132 feet wide, 2,200 feet back from the lake, and following its shore-line for a considerable distance, and the first half mile of Euclid Avenue. The former intersects Ontario Street in the Public Square of nearly 10 acres, thus cut into four equal quadrangles. This is the trade center of the city. From it great thoroughfares from 80 to 130 feet wide radiate. The minor streets are mostly at right angles to these thoroughfares. Cleveland is conspicuous for the width of its streets, of which almost all are lined with shade-trees. On account of its abundant foliage, Cleveland has won the name of the "Forest City." The dwellings of the city seldom are found in blocks, and tenement-houses are rare. Euclid Avenue is celebrated for its beauty and its handsome residences. West of the river are the Circle on Franklin Avenue; Lincoln Park on Jennings Avenue, containing 9 acres; Fairview Park, of 6 acres; Edgewater Park, of 98 acres; Edgewater Boulevard, of 8 acres; and Brookside Park, of 149 acres. On the East Side are the little Clinton Park, near the business part of the city; Lakeview Park, a strip of 10 acres extending 2,500 feet along the shore; and the Public Square, called Monumental Park. Wade Park (83 acres) is 4½ miles from the Public Square, on Euclid Avenue, and Gordon Park (112 acres) is 2 miles N. on the Lake Shore. Wade and Gordon parks are connected by Rockefeller Park, of 253 acres, which also extends south of Wade Park, being continued by Ambler Parkway, of 46 acres, to Shaker Heights Park, of 278 acres. Garfield Park, farther southeast, has 160 acres.

Woodland Cemetery, in the central part of the East Side, stretching from an avenue of the same name to Quincy Street, contains about 60 acres and is opposite the Catholic Cemetery on Woodland Avenue. Riverside Cemetery, of 120 acres, is in the Brooklyn district. At the eastern boundary of the city, on Euclid Avenue, lies Lakeview Cemetery, crowning an elevation which reaches 250 feet above the lake in its highest part. It is celebrated for its beauty, as also for the tomb of President Garfield.

Among the conspicuous public buildings of Cleveland are the Central Armory, the Cleveland Grays' Armory, the Western Reserve Historical Society Library, Women's College, Lakeside Hospital, several lesser hospitals, U. S. building, Northern Ohio Insane Asylum, House of Correction, Adelbert College, Case School of Applied Science, Cleveland Medical College, city-hall, county court-house, and Union Railway Dépôt. In addition to a natural drainage, due to its light and porous soil, Cleveland has an extensive system of sewerage. The water-supply is obtained from the lake through two tunnels, about 9,100 feet long, which end in a crib reaching to the bottom of the lake. Thence the water is pumped into reservoirs on the East Side, having a capacity of 115,000,000 gal. A new tunnel, 26,000 feet long, is nearly finished.

Education, Libraries, and the Press.—The board of education has under it 73 schools (1901) with 58,000 enrolled pupils, of whom 3,460 boys and girls are in the five high schools. It controls property valued at $5,500,000, and an expenditure of over $1,500,000 a year. It is estimated that 16,000 other children are enrolled in Roman Catholic, Lutheran parish, and many private schools. The WESTERN RESERVE UNIVERSITY (*q. v.*) comprises ADELBERT COLLEGE (*q. v.*), a college for women, schools of medicine, music, law, and dentistry, and academies at Hudson, O., and Green Springs, O. The Cleveland Medical College (founded in 1834) has a fine museum and library, and occupies an imposing building; the Case School of Applied Science, with a productive endowment of $2,000,000, possesses handsome stone edifices. There are in Cleveland a homœopathic college, and the medical department of Wesleyan University. The Cleveland Public Library, opened in 1853, has about 150,000 volumes, and is free: the Case Library Association, with property valued at $600,000, maintains for subscribers a circulating and reference collection of over 45,000 volumes; the Law Library, opened in 1870, has 20,000 volumes; the Western Reserve Historical Society has 25,000 books and a valuable collection of antiquities. From the press issue 7 English, 1 German, and 2 Bohemian daily newspapers, and about 125 trade, religious, and popular weekly and monthly periodicals. There are in Cleveland about 300 places of public worship, including 14 synagogues, exclusive of 6 convents and 2 monasteries.

Charities.—Hospitals, dispensaries, and maternity wards are connected with the medical schools; the municipal hospital is supported by the city, and has connected with it an infirmary and a department for the out-door relief of the poor. There are in the city a U. S. marine hospital and a Bethel home for sailors, a house of correction, industrial schools, and Roman Catholic and Protestant orphanages. The Lake Side Hospital owns extensive grounds and buildings. The Northern Ohio Asylum for the insane is a State institution founded in 1855.

Government.—The city is governed by a mayor and a city council, comprising two representatives for each of the

11 districts formed from the 42 wards. The assessed valuation of property for 1900 was $167,432,060; the fixed charges and current expenses of the government were $4,700,000 in round numbers, which included school maintenance. The bonded debt (1900) was $9,674,859, against which the city held $1,822,518 as the net sinking fund.

Communications.—The prosperity of Cleveland began with the construction of the Ohio Canal, the termini of which are the Cuyahoga river within the city limits and Portsmouth on the Ohio river, a line now largely abandoned. The Lake Shore and Mich. Southern, the Erie, the N. Y., Chicago and St. L. (Nickel Plate), the Cl., Cin., Chic. and St. L., the Cleveland and Pittsburg, as part of the Pennsylvania system, and the Balt. and Ohio, are six great trunk lines carrying the traffic of Cleveland, while several smaller railways enter the city. The lake commerce is large and expanding, and fine passenger steamers run daily to various ports on the Great Lakes. Six suburban street railways radiate from Cleveland.

Manufactures.—The U. S. census of 1890 returned statistics for 2,300 manufacturing establishments, employing a capital of $56,826,496 and 48,771 persons; wages paid, $27,596,408; value of product, $104,199,169. The following are the figures for the 10 largest industries: 21 iron and steel establishments, capital $13,738,850, employees 9,310, wages $5,702,116, output $23,932,430; 104 foundries and machine-shops, capital $7,997,233, employees 8,155, wages $4,533,223, output $13,432,334; 16 malt liquor establishments, capital $3,708,045, employees 516, wages $446,372, output $3,011,555; 8 ship-building yards, capital $2,587,775, employees 2,083, wages $1,188,662, output $3,091,300; 93 printing and publishing houses, capital $2,527,435, employees 1,789, wages $1,191,230, output $3,147,426; 16 paint-works, capital $1,664,003, employees 365, wages $243,830, output $2,008,986; 24 clothing establishments, capital $1,618,178, employees 1,833, wages $868,179, output $3,972,392; 15 planing-mills, capital $1,346,648, employees 883, wages $500,265, output $2,208,997; 21 slaughtering and packing establishments, capital $810,957, employees 474, wages $288,673, output $8,673,966; 6 flour and grist mills, capital $448,582, employees 126, wages $80,476, output $2,345,588. In the building of iron and steel vessels Cleveland surpasses all lake ports, on the average of the last ten years. Sternposts and shafts for U. S. naval vessels built on the Atlantic coast are forged in Cleveland; also heavy castings and forgings for bridges, street-railway machinery, and lifts for unloading vessels. Here is the center of the malleable-iron trade in the U. S. Important optical instruments and their mountings are made in Cleveland. Petroleum refining, hardware, boots and shoes, and chemicals give rise to important industries.

Commerce and Banking.—Cleveland is favorably situated for receiving and distributing the coal and petroleum from Ohio and Western Pennsylvania, and the mineral and lumber products from the upper Great Lakes. In 1900 there were 4,202 entries and 4,195 clearances at this port, of which more than half were for steam-vessels, and the freight received and shipped by lake in 1900 amounted to 7,369,423 tons. In the same year the total freight movement by lake, river, and canal was 22,096,000 tons. Iron ore, coal, and lumber are the leading staples in point of tonnage. There are 17 national banks, having a capital of $10,965,000, a surplus (Feb., 1901) of $3,555,328, deposits $48,780,227, and discounts $43,296,473. Ten trust companies have deposits of over $40,000,000; 23 savings-banks of more than $70,000,000; and there are many building and loan associations.

History.—In 1796 a party of surveyors, headed by Gen. Moses Cleaveland, and acting for a company which had bought Western Reserve lands from the State of Connecticut, laid out a town site on the east side of the mouth of the Cuyahoga. Its inaccessibility, Indian troubles, and the war of 1812–15 long delayed its development. In 1810 there were but 57 persons in the hamlet. Dec. 23, 1814, the General Assembly of Ohio incorporated the settlement as a village; in 1836 a city charter followed. Meanwhile Ohio City sprang up as a rival city on the west side of the river. The two places were united in 1854 as one municipality. East Cleveland was annexed in 1872, Newburg in 1873, and West Cleveland and Brooklyn in 1893. Pop. (1820) 350; (1830) 1,075; (1850) 17,034; (1870) 92,829; (1880) 160,146; (1890) 261,352; (1900) 381,768. EDITOR OF "LEADER."

Cleveland: town; capital of Bradley co., Tenn. (for location of county, see map of Tennessee, ref. 7–H); on East. Tenn., Va. and Ga. R. Rs.; 30 miles E. of Chattanooga. Here are seven churches, a large college for women, woolen-mills, stove-works, lumber-mills, wagon-works, and an organ-factory. Pop. (1890) 2,863; (1900) 3,858.

Cleveland, (STEPHEN) GROVER, LL. D.: twenty-second President of the U. S.; b. in Caldwell, N. J., Mar. 18, 1837. His father, Rev. Richard Falley Cleveland, was a Presbyterian clergyman, and when his son was four years of age accepted a call to Fayetteville, near Syracuse, N. Y. At this place, and a little later at Clinton, Grover received a good academic education. In 1853 he went to New York city and became a teacher in an institution for the blind, but not finding his duties congenial he determined to go West in search of other employment. Through the interest of an uncle he stopped in Buffalo, where in 1855 he became a clerk in the law-office of Rogers, Bowen & Rogers. Admitted to the bar in 1859, he was managing clerk for the same firm until 1862. In 1863 he was appointed assistant district attorney for Erie County, a position which he held for three years. In 1865 he became the law partner of Isaac V. Vanderpool, and in 1869 a member of the firm Lanning, Cleveland & Folsom. From 1870 he was for three years sheriff of Erie County. After nine years of professional prosperity he was in 1881 nominated for mayor of Buffalo, and elected by the largest majority ever given to a candidate in that city. He became popularly known as the "veto mayor," and the use of his prerogative in arresting measures which he deemed unwise and extravagant saved the city nearly $1,000,000 in the first few months of his administration. His popularity as mayor brought him prominently before the representatives of his party, and in Sept., 1882, he was nominated for Governor by the Democratic State convention held in Syracuse. The election which followed in November proved to be one of the most remarkable in the history of the country. Mr. Cleveland was elected by a plurality over his Republican opponent of 192,894. In office his policy was an expansion of that which he had pursued while mayor of Buffalo. In July, 1884, the National Democratic convention at Chicago selected him as its candidate, giving him on the first ballot 392 of 820 votes, and on the second 683. In his letter of acceptance he made it plain that, in case of election, he should consider himself as the servant of the people, as he had done while Governor and mayor. The canvass, in which Mr. Cleveland took no personal part, was remarkable for its discussion of personal peculiarities rather than for its consideration of political issues. Of the 401 electoral votes Mr. Cleveland received 219, Mr. Blaine, his Republican opponent, 182. Of the popular vote Mr. Cleveland received 4,874,986, Mr. Blaine 4,851,981.

On the part of the advocates of a reform in the civil service (see CIVIL SERVICE REFORM) there was a strong desire that the principles of such reform should be respected in Mr. Cleveland's administration. To a letter addressed to the President-elect, Mr. Cleveland, in a carefully prepared communication dated Dec. 25, replied that he recognized the justice of the demand for reform, and regarded himself as pledged to carry out the statutes on the subject in good faith. While the general tenor of the letter was favorable to reform, it was evident that the President would hold himself free to exercise his discretion in all cases involving what he regarded as "offensive partisanship." His views on the subject were embodied in the following sentence: "But many now holding such positions have forfeited all just claims to retention because they have used their places for party purposes in disregard of their duty to the people, and because, instead of being decent public servants, they have proved themselves offensive partisans and unscrupulous manipulators of local party management." When the President-elect entered upon office he announced that, "with the exception of heads of departments, foreign ministers, and other officers charged with the execution of the policy of the administration, no removals would take place except for cause." By this policy he at once came into collision with many influential members of his party who advocated the general and speedy removal of Republicans from office. The President decided to pursue a medium course. He made "offensive partisanship" a ground for removal, and the phrase became a by-word not very long after his inauguration. In the course of his first year in office about 18 per cent. of the postmasters were removed, and about 8 per cent. of the clerks in the departments in Washington. As he had done while Governor, so now as President Mr. Cleveland exercised the veto power with great freedom. This was par-

ticularly true during the session of Congress which ended Aug. 5, 1886, when of 987 bills which passed both houses he vetoed 115. In Dec., 1887, he devoted his annual message to the presentation of his views in favor of a reduction of the tariff. He advocated a radical modification of the existing policy by the adoption of a law framed with a view to the speedy establishment of the principles of free trade. The Republicans immediately took up the issue thus presented, and the question at once became the predominant issue of the canvass. Mr. Cleveland was unanimously renominated by the National Democratic convention in St. Louis on June 5, 1888. The efforts of both parties were directed chiefly to the doubtful States of Indiana, New York, New Jersey, and Connecticut. Mr. Cleveland carried all the Southern States, and in the North New Jersey and Connecticut, while of the doubtful States Mr. Harrison received the votes of New York and Indiana. Of the electoral votes Harrison received 233, Cleveland 168. The popular vote for Cleveland was 5,540,329, that for Harrison 5,439,853.

At the close of his administration on Mar. 4, 1889, Mr. Cleveland retired to New York city, where he re-entered upon the practice of his profession. It soon became evident, however, that he would be prominently urged as a candidate for renomination in 1892. As time progressed, the probability of his nomination became more and more certain, and at the National Democratic convention, which met in Chicago June 22, he received more than two-thirds of the votes on the first ballot. In his speech of acceptance, delivered to a vast concourse in Madison Square Garden, New York, he reiterated his views as to the necessity of tariff reform, and thus made it certain that the tariff question would be the principal issue at stake at the election in Nov., 1892. In that election there was a remarkable reversal of the popular will of four years before. The Democrats carried twenty-three States, including, for the first time in years in a presidential contest, Illinois, Indiana, and Wisconsin. The popular vote stood 5,553,142 for Cleveland, 5,186,931 for Harrison, and 1,030,128 for Weaver of "the People's" party. In the electoral college Mr. Cleveland received 276 votes, Mr. Harrison 145, and Mr. Weaver 23. On Mar. 4, 1893, Mr. Cleveland was a second time inaugurated President at Washington. (See vol. xii., p. 63.) At the close of his second administration he retired to Princeton, N. J.

Mr. Cleveland married at the White House, June 2, 1886, Miss Frances Folsom, daughter of his former friend and partner, Oscar Folsom, of Buffalo. C. K. Adams.

Clev'enger, Shobal Vail: sculptor; b. at Middleton, Butler co., O., Oct. 22, 1812; worked as a stone-cutter in Cincinnati; executed portrait-busts directly in free-stone; opened an atelier in New York and made statues of eminent men, still preserved in the art collections of Boston, New York, and Philadelphia. In 1840 he visited Italy, where he passed three years, dying at sea on his way home, Sept. 23, 1843. His best-known work includes statues of Daniel Webster and Henry Clay, and a bust of Edward Everett and a *North American Indian*, which attracted attention in Italy from the novelty of the subject there.

Cleves (Germ. *Kleve*): chief town of the circle of Düsseldorf, Rhine province, Prussia; on three hills about 2 miles from the Rhine; 48 miles N. W. of the city of Düsseldorf (see map of German Empire, ref. 4–C). It has a castle dating from 1439; also manufactures of cotton, silk, and woolen fabrics, etc. Pop. (1890) 10,409.

Clichy, klēē'shee': a town of France; department of Seine; 4½ miles N. W. of Paris, of which it is a suburb (see map of France, ref. 3–F). Pop. (1881) 24,320; (1896) 33,895.

Cliff: an abrupt descent of the land-surface. Cliffs are of three kinds: 1. Those made by dislocation of the earth's surface, exposing the abrupt faces of fractures, as in the broken lava cliffs of South Oregon, and presumably in the colossal granite cliffs of the Yosemite Valley (*q. v.*). Many cliffs in the high plateaus of Utah have wasted back a moderate distance from original fracture faces of this kind. 2. Cliffs, bluffs, and escarpments mark the weathering and retreating outcrops of hard, nearly horizontal strata, surmounting a stony slope or talus that covers the underlying weaker strata. The Book cliffs of Western Colorado are remarkable examples of such forms. The chalk escarpments inclosing the Weald of Southeastern England are smaller examples of the same kind. Irregular cliffs and precipices also occur on slopes of deep valleys worn in the disordered rocks of mountains. 3. Sea or lake cliffs are formed by the undercutting of shore-waves. These are marked by a level base, independent of fractures or rock structure, by a variable height dependent only on the altitude of the coast in which they are cut, and by a comparative freedom from waste or talus at their base. The cliffs of Dover, England, are well known. The sea-cliffs of the Orkney islands are among the highest of their kind in the world. W. M. Davis.

Cliff-dwellers: those aboriginal tribes of the western parts of North America who habitually made their homes in the natural recesses of the cliffs. See Cliff-dwellings below.

Cliff-dwellings in the U. S.: dwellings and groups of dwellings built in natural recesses in the cliffs in the valleys of the Rio Grande and the Rio Colorado, and more especially upon some of the eastern tributaries of the latter stream. The walls are skillfully constructed of stone laid in mortar made of the native *adobe* clay. In some cases the stone is broken into somewhat uniform blocks, which are rudely dressed upon the exterior surface. The interiors of the houses are often plastered; in some instances the exterior also has received a coat of clay, and upon this has been laid in rare cases a wash of white clay.

Many of the houses are small and occur singly, occupying restricted niches or shelves in the cliffs, but when the recesses are large the plan is often expanded, and the structure becomes a communal dwelling or village of many rooms irregularly arranged to fill the spaces, and with exterior walls conforming to the irregular margin of the precipice. Two and even three stories are not unusual, and, although the work is all primitive, the effect of feudal architecture is suggested by the round towers, the diversified plan, and the irregular distribution of windows and doors over the crumbling façade.

The doors and windows, which are somewhat square, have wooden lintels, and appear to have been closed by stone slabs, skins, or blankets. The arch was unknown. The upper floors and roof were supported by poles set in and generally penetrating the walls. In many cases the overhanging ceiling of the recesses made roofs superfluous, the walls being carried the entire height.

The many striking features exhibited by these strange dwellings have excited much interest, and led to serious misconceptions as to the status and affinities of the peoples concerned in their construction.

The peoples now occupying the pueblo towns of this region undoubtedly represent to a large extent the ancient tribes, and not a little evidence has been collected bearing upon this point. This evidence is derived mainly from two sources—a study of the traditions of the modern peoples, and a comparative study of ancient and modern art.

The stories related by the town-builders of to-day are interesting and romantic. The Tusayan Indians, according to tradition, dwelt at first in the lower depths of the earth, but escaped finally by means of magic cane-stalks that sprang up with such vigor as to penetrate the multiple roofs of the lower world. Assisted by their magic guardians and divinities, they learned the ways and arts of the upper world. Their wanderings before they finally settled upon the mesas of Tusayan were long and full of adventure. One myth explains the existence of deserted dwellings scattered everywhere over the desert as follows: the snake gens lived at first, each family in a snake skin hung on the end of a rainbow, which, as it swung around in the sky, dropped them here and there upon the earth, where they immediately began to build their dwellings. At another stage of their wanderings a brilliant star arose, which would shine for a while and then disappear. The wise men said that beneath that star the people for whom they sought would be found. So they followed when the star shone, and when it disappeared built their dwellings to await its reappearance, and in the end a vast number of ruins were scattered over the land.

One of the halting-places of the Horn people, a gens of Tusayan, is described as a cañon with high, steep walls, in which was a running stream. Here they built a large house in a high, cavernous recess. Much time was spent in making ladders and in cutting stairways up the rocky approaches. The women and children gathered the stones and made the mortar for building, and portions of the tribe attended the gardens in the valley below. Many of these traditions are made to refer to special ruins, but, with a few exceptions, little reliance can be placed upon the identifications. The stories are not derived from the past, but are invented to

explain the puzzling culture-phenomena of the surrounding country.

The Zuñis and the tribes of the Rio Grande relate similar stories of the past. Although there is in a general way close analogy between the traditions, the arts, and the customs of the several pueblo tribes of to-day, the marked differences in language clearly indicate the presence of at least four stocks of people. A glance at the art remains seems to indicate greater unity in archaic times. Ancient art in stone and clay corresponds very closely over a wide region to the pottery of the cliff-dwellings. This unity of art is indicative in a measure of homogeneity of people.

Explorers tell us many wonderful things of the ancient ruins of the pueblo country—of ruined cities on the plains, of fortresses in the cliffs, of standing stones, of walls and towers and cisterns and causeways and canals, of cave-cities dug in the chalk-like bluffs, and of burrows beneath beds of lava or in the sides of cones of indurated ash. Much has been made of this remarkable diversity of remains and complexity of peoples and cultures, and a succession of periods of occupation has been assumed, but much of this diversity may be explained by calling to our aid the simplest principles of art growth. The dwellings of a people are to a great extent what the immediate environment of that people makes them.

The pueblo country is a semi-desert, made up of table-lands of varying heights, cut by the waters of rivers which rise in the mountains and radiate to the sea. This cutting gives a multitude of irregular plateaus of varied and remarkable outlines, with steep sides and escarped margins. The geologic formations lie to a great extent in horizontal beds, and consist of alternating groups of hard and soft strata. The streams as they cut down through these formations eat their way to the right and left by attacking the softer layers. These being removed, the hard strata above break down in masses of varying sizes all along the sinuous margins of the plateaus. These constitute nature's quarries, and furnish, ready-shaped to the hand of the home-maker, unlimited quantities of material. This method of erosion, by undermining the hard ledges, gives, besides these deposits of building-stones, a peculiar conformation of the cliffs, affording natural dwelling-places for men. Everywhere there are shelves, shallow shelters, and capacious recesses, and where the valleys are deep there are tiers upon tiers of these natural dwellings, many being beyond the reach of man.

Now, it is not hard to foresee the effect of these remarkable conditions. A tribe of wanderers approaching from the south, scorched by the sun and stifled by the alkali-dust of the plains, would seek the shadows of the great rocks and make their homes in the cool recesses. A boreal people, coming down from the north, would find shelter beneath the roofs of the desert into which they had wandered. Men approaching from any quarter, and from lands far or near, would at once make their homes in the cliffs, and before a generation had passed they would not only be cliff-dwellers but cliff-builders. For convenience of occupation, they would level up a floor. To shelter from the wind or to protect from an enemy, they would raise huge stones or build walls across the openings. Three walls and the roof were already furnished by the natural recesses, and the stones were at hand to close in the front and complete the dwelling. Nature, under such conditions and by such suggestions, would make cliff-dwellers of any race beneath the sun.

On occasion, when the accommodations of modified natural shelters became insufficient, when stone was plenty and enemies were not threatening, building extended to independent construction, and houses and communal dwellings of stone sprang up wherever land was fertile and the water-supply was abundant.

With these peoples dwellings in valleys and upon plains undoubtedly came first, as valleys had to be ascended and plains crossed before the plateau land was reached, but not until this land of ever-present stone environment was reached and adopted as a permanent abode would stone-building become a prevalent and a well-established art. At any period of the history of the peace-loving town-builders the approach of strong foes would lead to the occupation or the reoccupation of nature's strongholds.

It is not uncommon to see communal dwellings, round towers, cliff-houses of masonry, and excavated bluff-dwellings all in a single group, all connected, and grading in their features of construction one into the other.

Cliff and cave dwellings are not known to have been occupied extensively in recent times, but limited occupation has been recorded in a number of cases, and the newness of the masonry, the freshness of the plastering, the wonderful state of preservation of pottery, wooden tools and utensils, woven fabrics, baskets, sandals, mats, bows, arrows, and hafted tools of all kinds, and the practical identity of all these things with modern work, connect them definitely with the present period, and lead to the conclusion that the ancient and modern peoples are closely related in blood and in history.

AUTHORITIES.—W. H. Jackson, Hayden's *Annual Report* for 1876; W. H. Holmes, Hayden's *Annual Report* for 1876; Victor Mindeleff, *Eighth Annual Report* of the Bureau of Ethnology. W. H. HOLMES.

Clifford, NATHAN, LL. D.: jurist; b. in Rumney, N. H., Aug. 18, 1803; educated in Haverill and Hampton in his native State; was admitted to the bar and settled in York, Me., in 1827. He served in the Maine Legislature 1830–34; attorney-general of the State 1834–38; member of Congress 1839–43; an effective Democratic speaker; Attorney-General in the Polk cabinet 1846–48, when he was sent to Mexico to arrange the terms of the treaty of peace; made associate justice of the U. S. Supreme Court by President Buchanan in 1858; member of the Electoral Commission which decided in 1877 the Tilden-Hayes contest; was the author of two volumes of *United States Circuit Court Reports* (1869). Died from the effects of an amputation of his foot in Cornish, Me., July 25, 1881.

Clifford, WILLIAM KINGDON, F. R. S.: mathematician; b. in Exeter, England, May 4, 1845; educated at King's College, London, and at Trinity College, Cambridge; was second wrangler in the mathematical tripos of 1867; Professor of Mathematics and Mechanics in University College, London, 1871–79. He was widely known as a versatile lecturer and an original thinker on philosophical and scientific subjects; contributed to the *Proceedings* of the London Mathematical Society; author of *Elements of Dynamics* (part i., 1878; part ii., edited by R. Tucker, 1887); *Common Sense of the Exact Sciences* (completed and edited by K. Pearson, 1885); *Mathematical Papers* (1881); *Seeing and Thinking*, a series of lectures (1879); *Lectures and Essays* (edited by L. Stephen and F. Pollock, 1879; 2d ed. 1886). D. in Madeira, Mar. 3, 1879.

Clifton: a fashionable watering-place of Gloucestershire, England; a western suburb of Bristol (see map of England, ref. 12–F). Clifton has an important public school and a suspension bridge spanning the Avon at a height of 245 feet. Pop. 30,000.

Clifton: a post-village of Stamford township, Welland co., Ontario, Canada; on the Niagara river at the suspension bridge, a mile below the Niagara Falls (see map of Ontario, Canada, ref. 5–E). It is the eastern terminus of the Great Western Railway, and is on the Erie and Niagara Railway. It has a very large export trade to the U. S. and a large museum. Pop. 2,347.

Clifton Springs: on the Auburn branch of the New York Central R. R.; situated in Manchester and Phelps townships, Ontario co., N. Y. (for location of county, see map of New York, ref. 5–E). It has copious sulphur springs, and is the seat of Clifton Springs Sanitarium, a noted resort. Pop. (1880) 902; (1890) 1,297; (1900) 1,617.

Climac'teric Year [from the Gr. κλιμακτερικός, from κλῖμαξ, a ladder]: the name given, especially in former times and by believers in astrology, to the years in which a critical change is supposed to take place in the human constitution or fortunes. These were supposed to be the years ending the third, fifth, seventh, and ninth period of seven years, the grand climacteric or most critical time of human life being supposed to be the sixty-third year. Some added the eighty-first year. The supposed mystical character of the number seven probably gave rise to this belief. There is an actual climacteric period in the lives of women, which usually occurs between the forty-fifth and fiftieth years.

Climate, Climatology, and **Climatography**: CLIMATE [from Fr. *climat*, viâ Lat. from Gr. κλίμα, κλίματος, slope, (supposed) slope of the earth from equator to poles, latitude, clime; deriv. of κλίνειν, to incline] is the average weather or mean of the atmospheric conditions of a place or region. CLIMATOLOGY is the science of climates, and CLIMATOGRAPHY is the descriptive part of climatology, or a description of climatal provinces. Weather is the instantaneous, passing, or current condition of the atmospheric elements. Clima-

tology and the science of the weather together make up meteorology. The science of the weather is often called meteorology proper.

The expression of the facts of climatology is made in terms of the same elements as in the science of the weather, but they have a different order of importance in the two branches of meteorology. In the weather the pressure of the air (barometric pressure) is the leading element, and is used as a key to the whole situation. In climatology the temperature is of leading importance, and after it come the forms of water (moisture, cloud, precipitation) and the winds. Climatology still gets its chief importance from its relations to man and his operations, its relations to organic life, and to the sculpture of the earth's surface: while meteorology proper has already reached a point where it is studied as a science, finding its nearest scientific relationships in hydrodynamics.

On climatological maps the data of air-pressure and temperature are usually reduced to what they would be at the level of the sea, thus eliminating the irregularities of the earth's surface and greatly increasing the simplicity of the map and the ease of comprehending it. The correction of the pressure to sea-level means the addition of about an inch to the reading of the barometer to each thousand feet of elevation. The correction of temperature is more difficult, because the rate of change varies greatly with the season, the time of day, the state of the weather, and the geographical position. In round numbers from 2° to 5° F. must be added for correction for each thousand feet of elevation. The rate of change of temperature decreases with increase of altitude. When the data thus corrected have been entered on maps, lines are drawn through the places having the same temperature, and these are called *isotherms*, while those through the same pressures are called *isobars*. The precipitation and cloudiness are not reduced for elevation, and the corresponding lines of equal precipitation and cloudiness are called *isohyetals* and *isonephs*. Snowfall is generally reduced to equivalent amounts of rainfall. It is found that on the average the corresponding depth of rain is one-tenth that of the snow. The direction of the wind is shown by arrows which fly with the wind. Thus for what is called a N. W. wind the arrow flies S. E. The customary paths of storms are indicated on the maps by heavy unbroken lines.

The above relates only to the mean data in the climate of a region. The applications of climate to man and organic nature make it necessary also to take into account the amount of variation from the mean values, and the frequency and rapidity with which these variations occur. Two places may have the same mean annual temperature of, say, 50° F.; but one may have a mild and equable climate, highly suitable for invalids, while the other may be severe and rigorous in the extreme. This would be the case if in the one the temperature changed only slowly between 20° and 80°, while the other had frequent and rapid changes with extremes at 10° and 110°. Two things are here involved, quite different but not usually distinguished: the range from lowest to highest, and the frequency or rapidity of large fluctuations. The distinction is of considerable importance, but the language lacks definite terms to distinguish them. To permit the free use of this distinction, the terms mild and severe will be used to express the quantity of the change, and equable and rigorous to express the frequency of the fluctuations, more especially in reference to temperature. Thus a *mild climate* is one in which the changes are slight, a *severe climate* one in which the changes are great, an *equable climate* one in which there may be considerable changes, but these are slow, a *rigorous climate* one in which serious changes occur frequently, and therefore rapidly. A severe climate is not dangerous to animals and plants, is not uncomfortable to man; but its action is rather that of a tonic to the human race, and may be used for this effect in some forms of disease. A rigorous climate, on the other hand, is tolerated by few forms of animals and plants, is inimical to the best development of the human race, and even rapidly disintegrates the rocks. The relative mildness or severity of climates is occasionally represented on maps by lines of equal divergence from the mean, called *isabnormals*. The relative equability and rigor of climates has been the subject of many studies, but there is as yet no general agreement as to the best way of graphically or numerically expressing it.

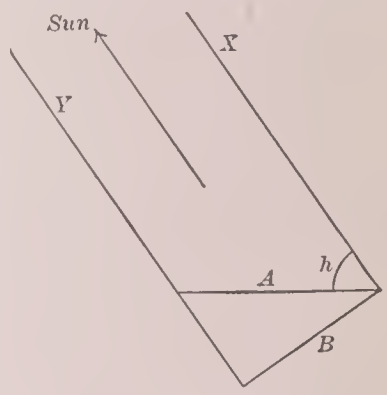
Questions of varying climatic phenomena are often treated on maps, frequently in terms of the probability of recurrence of the phenomenon.

Solar or Astronomical Climate.—Solar climate is concerned with supposed climatic effects, if the earth were a smooth, hard ball, and the surface homogeneous. The sun is the chief controller of terrestrial climate; the effect of the other heavenly bodies is, so far as known, insignificant, hence solar and astronomical climate are the same thing. The problem of solar climate is only that of climate reduced to the simplest possible elements. So far as the radiant field of the sun is concerned, it is the question of the quantity of the sun's heat which reaches the earth and of the effect of the atmosphere on this heat and of the heat on the atmosphere. The fundamental principles and facts underlying these questions are given with abundant fullness in the elementary physiographies and astronomies. In what follows, some conclusions of importance only will be given.

In every case considered it must be remembered that the earth as a whole and each individual point on it are both gaining and losing heat, and the resulting temperature strikes the balance between the two. The gain in heat is by insolation, and is doubly periodic, one period being due to the rotation of the earth on its axis, the other to the revolution around the sun. The earth loses heat by radiation in space, and this continues steadily and without interruption. With this premised, the following conclusions may be briefly stated:

If there is no air—

1. The isotherms will be parallel to the equator, because, on the average, each point of any parallel of latitude would receive just as much heat as any other point of the same parallel. This would be true also if a dry atmosphere were present.



2. The intensity of midday insolation in different latitudes varies as the sine of the sun's altitude. For let $X\,Y$ be a beam of sunshine when the arrow points in the direction of the sun, and the angle h is the sun's altitude. Then the beam which, if the sun were vertical, would be confined to the line B is by the slope spread over the horizontal line A. Its intensity is decreased in the ratio $\frac{B}{A} = \sin h$. As the average value of h for the year equals 90° minus the latitude, sine h can, with sufficient approximation, be put equal to cosine latitude, and we have the general climatic fact that the midday intensity of the sun's rays decreases as the cosine of the latitude. The mean daily intensity, however, includes the intensities for the hours before and after midday, when the sun is lower and h consequently smaller. It depends, therefore, on both the meridian altitude of the sun and on the length of the day, and no longer runs with the cosine of latitude. The expression for this is complicated, and can be found in Ferrel's *Recent Advances in Meteorology* (1885, pp. 75–84).

3. The increase in the length of the day poleward in summer compensates for the higher latitudes. The following are the values of the mean solar intensities for the first of each month and for each ten degrees of latitude for the northern hemisphere. The figures express the percentages of the mean intensities in terms of the intensity when the sun is constantly vertical.

MEAN INTENSITIES OF SOLAR RADIATION, OUTSIDE OF THE ATMOSPHERE.

DATE.	LATITUDES NORTH.									
	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°
Jan. 1.	0·30	0·27	0·22	0·17	0·12	0·07	0·02	....	....	....
Feb. 1.	0·31	0·28	0·24	0·20	0·15	0·10	0·05	0·01	....	....
Mar. 1.	0·32	0·30	0·28	0·25	0·20	0·16	0·11	0·06	0·01	....
Apr. 1.	0·32	0·32	0·31	0·30	0·27	0·24	0·20	0·15	0·10	0·08
May 1.	0·30	0·32	0·33	0·33	0·32	0·30	0·28	0·25	0·25	0·26
June 1.	0·29	0·32	0·33	0·34	0·35	0·35	0·34	0·34	0·36	0·37
July 1.	0·28	0·31	0·33	0·35	0·35	0·35	0·35	0·36	0·37	0·38
Aug. 1.	0·29	0·32	0·33	0·33	0·33	0·32	0·30	0·28	0·29	0·30
Sept. 1.	0·31	0·32	0·32	0·31	0·29	0·26	0·22	0·18	0·14	0·14
Oct. 1.	0·32	0·31	0·29	0·26	0·22	0·18	0·13	0·08	0·06	....
Nov. 1.	0·31	0·29	0·25	0·21	0·16	0·11	0·06	0·02	....	....
Dec. 1.	0·30	0·27	0·22	0·18	0·12	0·07	0·02	....	....	....
Year..	0·30	0·30	0·29	0·27	0·24	0·21	0·17	0·14	0·13	0·13

This table brings out the surprising fact that the solar intensity is not always greatest at the equator, but that about the vernal equinox it is actually greatest at the pole—due to the continuous day then existing in that latitude. It is a well-known fact that in midsummer the heat in high latitudes in the afternoon is greater than in the tropics.

4. Defining a "thermal day" as the equivalent of an average day at the equator (in mean intensity of solar radiation), the table annexed will express the annual sum of solar radiation. It is taken from Hann's *Handbuch der Klimatologie* (1883), p. 67.

ANNUAL SUM OF SOLAR RADIATION.

Latitude.	Thermal days.
0°	365·2
10	360·2
20	345·2
30	321·0
40	288·5
50	249·7
60	207·8
70	173·0
80	156·6
90	151·6

From this it appears that the pole receives about 41 per cent. of the radiation received by the equator. If the sun remained on the equator, the pole would receive no heat.

5. The southern hemisphere attains a greater intensity of heat than the northern, because perihelion occurs during its summer. The intensity of the sun's rays in Australia and South Africa has frequently been mentioned by travelers.

6. The quantity of heat received by the entire earth is the same for equal times in all parts of its orbit. This is a result of the generalized form of Kepler's areal law (Ferrel, *op. cit.*, p. 82). As the winter occurs in the southern hemisphere at aphelion, and it has already been shown that the intensity of solar radiation is higher in summer, it follows that the climate of that hemisphere is more severe than that of the northern.

7. If the atmosphere is added, but without moisture, a large part of the solar radiation is absorbed by it and fails to reach the earth. The amount of absorption is, in round numbers, about one-fourth when the sun is vertical, and increases gradually with decrease of altitude of the sun until at the horizon all is absorbed or diffused. The average absorption and diffusion of the atmosphere is approximately two-thirds. The diffusion extends the hours of daylight by the length of morning and evening twilight.

8. There is also a selective feature in the absorption of the solar radiations, those of medium wave-length being best transmitted, while those of longer and shorter wave-length are more largely absorbed. The dark heat rays radiated from the earth are retained near the surface, and aid in keeping the surface temperature relatively high.

9. In the atmosphere itself a circulation is established, the air rising in the vicinity of the warmer equator, flowing off above toward the pole, to settle sooner or later to the surface and flow toward the equator to take the place of the air which rises in that region. These movements, which would be directly north and south if the earth were without motion, become changed in direction so soon as the earth begins to rotate, according to a general law first fully developed by Ferrel. Rotation causes a deflection to the right in the northern and to the left in the southern hemisphere. The result is that the inflowing equatorial surface current becomes the northeast and southeast trade-winds, and the outflowing, pole-seeking upper current becomes the westerly anti-trades.

10. The isobars theoretically would also be parallel to the equator on a non-rotating sphere, but the combined effect of the rotation of the earth and the circulation above given causes the isobars for greatest pressure to be at about 30° N. and S. latitude, and the minimum isobars to be at equator and poles. Ferrel, *Popular Treatise on the Winds*, 1889, pp. 133–145.

11. If, now, moisture is added to the air there are many quantitive and qualitive changes in the above statements, the most marked being due to the formation of clouds. It is highly probable that these clouds would not be symmetrically formed, in which case a long series of unsymmetrical arrangements would be set up and the pure solar climate would approximate the actual terrestrial climate.

The phenomena above mentioned all belong to the radiant field of the sun. Evidence is accumulating to show that the sun's coronal field also has appreciable meteorologic, and consequently climatic, effects, but this side of the subject is still too new (1893) to admit of more than a passing reference.

Actual or Physical Climates.—The introduction of the actual irregularities of the earth leaves the preceding still correct, except that the symmetry is destroyed, while variations of the material and elevation of the surface produce corresponding climatic variations, and give rise to storms which cause an independent series of fluctuations. The distribution of land and water, the ocean currents, the elevation of the land above the sea-level, the greater or less efficiency of mountain ranges as wind-breaks, and the clothing of the earth's surface are the leading causes of the variations on solar climate. The combined effect results in the following types of climate:

The *tropical* climate is usually mild, equable, and warm, not often disturbed by general storms, but subject to small local storms, usually coming on in the afternoon. Both seasonal and diurnal phenomena usually occur with great regularity. Hurricanes and typhoons are oceanic, autumnal, general, storms of great violence which originate in the tropics but pass into the temperate zones, where they take on the character of general storms of the temperate region.

The *sub-tropical* climate has the equability of the tropical, but not its mildness. The weather is generally settled, and storms are relatively infrequent. It is more liable to insufficient rainfall than the adjacent climates of higher or lower latitudes. General storms rarely originate in this latitude; local storms, though less regular than in the tropics, are frequent and sometimes violent. Areas of high pressure are more inclined to become stationary here than in higher latitudes.

The *temperate* climate is the climate of unsettled weather, and is consequently more severe and more rigorous than the preceding. It has more cloud and fog. Storm conditions pass frequently eastward. Local storms are usually confined to the warm season.

The *arctic* climate is cold and very severe, precipitation small, summers short and very hot.

The *alpine* climate, found on high mountains, is more rigorous than the arctic climate, and has a longer summer, with great solar intensity, because of the rarity of the air at high elevations.

Oceanic climates are relatively cool, mild, equable, cloudy, and moist. *Insular* and *littoral* climates partake of the same character. *Continental* climates are relatively severe, rigorous, clear, and arid. In *desert* climates the continental features are still more strongly accentuated.

Where mountains serve as wind-breaks, the air is forced upon the windward side, becoming chilled and losing its moisture. It descends on the other, already dry and becoming warm by the fact of the descent. When the wind is high this air becomes a warm, drying wind, called the *Föhn*, chinook, etc. *Windward* climate is consequently cool, cloudy, and wet. *Leeward* climate is warm, dry, clear, and subject to the chinook winds.

A glance at the isothermal map herewith shows some interesting cases of the causes of variation of climates mentioned above. For instance, the western coasts of continents are warmer in temperate regions, the eastern in the tropics. This is due to the prevailing winds, aided by the ocean currents. The most efficient current is the Gulf Stream, which gives Iceland the annual temperature of Newfoundland, causes a temperate climate far into the Arctic at North Cape, and even affects the annual isotherms of Spitzbergen and Nova Zembla. On the rainfall map which accompanies this article, the heavy littoral rainfall on the west coast of the Americas in the higher latitudes, combined with light rainfall inland, is due to the break of the winds by the Coast Range in the one case and the Andes in the other. Exactly the reverse prevails in tropical America. Similar considerations enable us to explain each great departure from symmetry on the maps.

CLIMATOGRAPHY.—1. *The United States* reach the tropical climate only in the southern part of the peninsula of Florida. The remainder of the area is sub-temperate and temperate in climate, except Northern Alaska, which is arctic. More than half of its sub-temperate area requires irrigation for successful agriculture. A large part of the western temperate region has a leeward climate, the windward part being confined to relatively narrow strips on the western slopes. The shores are all bathed with warm water, except New England, where the deflection eastward of the Gulf Stream permits access of colder northern waters. The Great Lakes moderate the continental features of the climate in the region to the east of them. The great fluctuations in the meteorologic elements are chiefly due to the general storms or areas of high pressure which traverse the country from west to east. The most of these appear first on the northwestern border, and, because of the lack of a transverse range of mountains to the north, these are apt in winter to bring severe cold with them. Few cross from the Pacific or orig-

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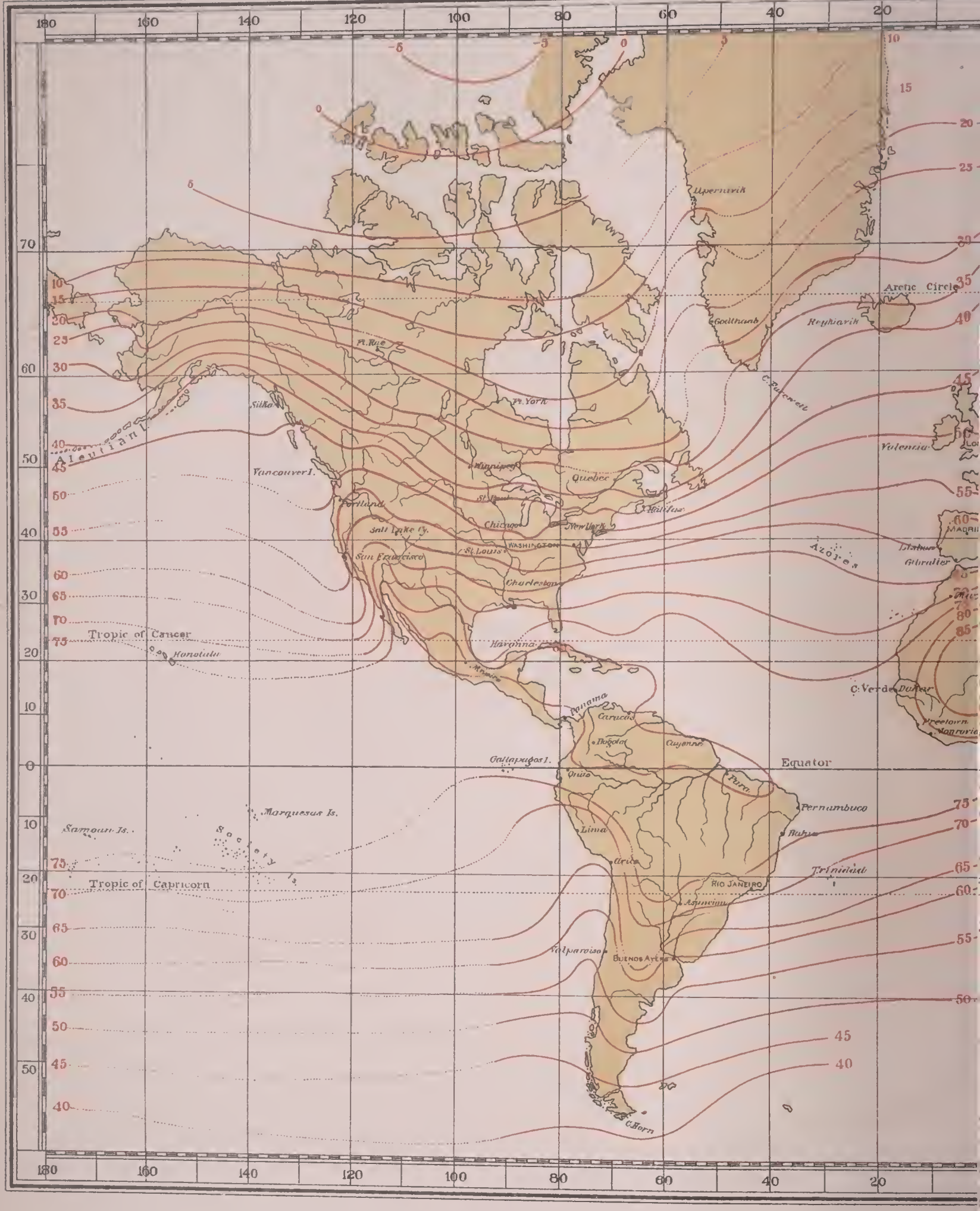

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inate within the States. Still fewer come up northeastward from the Gulf of Mexico, but sometimes one skirts the eastern coast. The latter are hurricanes which have lost their dangerous violence by the time they strike the mainland. The local storms are phenomena of the warm season, and occasionally exhibit great energy as cloudbursts and tornadoes. The heaviest rainfall is on the northwest coast and on the Gulf coast of Florida. At Neah Bay, Washington State, the mean of eight years is 108 inches. In Florida, at Tarpon Springs, it averaged 84·5 inches for five years; at Fort Barrancas, 70 inches for twenty-three years. Nearly as heavy an annual rainfall occurs about Cape Hatteras. At Hatteras for seventeen years it averaged 68 inches. The smallest observed rainfall is in the Colorado desert in Southern California. At Mammoth Tank (lat. 33° 7′ N., lon. 115° 17′ W.), the mean of thirteen years is only 2 inches. In general, the valley of the Colorado river is the area with the smallest rainfall.

The climate of the southern extensions of Alaska (the Aleutian and Alexander islands) is mild, equable, temperate, wet. That of the southern part of the mainland is continental and sub-arctic, while the northern part is thoroughly aretic.

2. *Dominion of Canada*: temperate in the southern part, it is thoroughly sub-aretic and arctic over the most of its area. The great expanse of Hudson's Bay, open poleward, and the absence of mountains to the north give free access to Arctic weather over this great continental area, while Labrador and Newfoundland are chilled by an Arctic current. The leeward climate east of the Rocky Mountains extends farther northward than might be expected, reaching distinctly to the Peace river (lat. 56° N.), and perhaps farther north. The area E. of a line from Great Slave Lake to Lake Superior and N. of a line from the north shore of Lake Superior to Anticosti island is apparently too arctic for any possibility of successful agriculture.

3. *Mexico*, though for the most part within the tropics, has a climate which is temperate, mild, equable, and dry. The coolness of the climate is due to the elevation. The tropical climate is found on a relatively narrow fringe of coast where it is wet, and in the peninsulas of Lower California and Yucatan, which are dry. Rain in summer and autumn; dry in winter and spring.

4. *West Indies*: tropical and equable, with rain at all seasons, but chiefly in summer.

5. *Tropical Cordillera Province*: climate of perpetual spring; two rainy seasons, one in early summer, the other in autumn, with a short dry season between, and a long dry season in winter and spring.

6. *Tropical America*, not Cordilleran: tropical and equable; a single late summer or autumn rainy season S. of the Amazon, but a double one, as in the preceding, N. of that river, except in inner Guiana, where there is rain through the year, but most in winter.

7. *Chilian Province*: sub-tropical and dry in the north; temperate and very wet in the south; maximum rainfall in winter.

8. *Pampas Province*: rigorous and dry; rainfall in summer.

9. *West European Province*: temperate in the north and sub-temperate in the south; stormy, not strictly continental. Precipitation not clearly seasonal.

10. *East European*: like the preceding, but distinctly continental, and with a summer maximum of rainfall.

11. *Siberian Province*: strongly continental and growing more arctic to the pole of cold, which lies N. of Yakutsk in lat. 67° N.; the most severe climate known; precipitation small.

12. *Asiatic Plateau Province*: dry, severe, and rigorous.

13. *Chinese Province*: temperate and sub-temperate; rain in summer.

14. *Japanese and Philippine Province*: insular, temperate and tropical, wet; winter rains from Nipon northward, summer rains south.

15. *Monsoon Province*: summer and autumn rains; tropical, mild, equable.

16. *Desert Province*, from the Western Sahara to the basin of the lower Indus; dry and poor in plant life; very rigorous and severe.

17. *Tropical African Province*: warm, but tempered by the elevation, except on the coast; mild and equable; double summer and autumn rainy season.

18. *South African Province*: sub-tropical, dry, generally continental.

19. *Australia*: generally dry and continental, temperate and sub-temperate; in the north a single rainy season in summer; in the central and western part no rain; in the southwest rain in winter.

20. *Polynesia*: insular, tropical; rain generally in summer.

Climate and Mankind.—There are certain broad, general effects which require enormous periods of time to work themselves out. These belong rather to an account of the evolution of animal and plant forms. In this place opportunity will be taken only to point out some more immediate effects of climate on organic life. First, so far as man is concerned:

1. He evades climatic effects by a series of ingenious devices, which together form a large part of the apparatus of civilization. Man covers himself with clothing and regulates its quantity, material, and color in such a way as to protect himself from extremes of temperature and from precipitation. He constructs dwellings within which he creates climates to suit himself, and he even makes these dwellings peripatetic, in the form of railway-coaches. His furnaces and stoves raise the temperature when necessary, and his punkahs and artificial or natural ice can lower it when it is too high. By commerce he gets the food products of other climates; by means of hothouses he grows tropical productions in temperate climates; and by the numerous methods of the preservation of foods he can interchange the products of the seasons. By irrigation and drainage he overcomes the scarcity or surplus of water, and successfully raises plants in places where natural conditions had forbidden them to grow. In short, he can at will create for himself an artificial climate or remove himself to a new one, and he can force productions not belonging to his climate, or transport them from their home as he pleases.

2. Mankind as a whole is very tolerant of climatic extremes. He is entirely tolerant of reductions of air-pressure by one-fourth, and even changes of one-half the sea-level pressure cause him little inconvenience if the change is gradually made. Of the changes of 1 or 2 inches of the mercurial column (one-thirtieth to one-fifteenth of the total pressure) he is entirely unconscious from his sensations. He is tolerant of all climatic temperatures, if the simplest and most obvious precautions are taken. The temperature is nowhere continuously above blood-heat, and Peary has shown that if the poles have not been reached, it is for other reasons than that the climate is too rigorous for man to endure. The lowest temperature recorded as endured by man is −71° C., or −96° F., reported by Gilder, who accompanied Schwatka in his Franklin search-party. The highest at hand is that recorded by Buveyrier among the Tuaregs, viz., 67·7° C., or 154° F. While there is not every guarantee of the exactness of these numbers, yet there is no good reason for doubting them. The range from lowest to highest is 138·7° C., or 282° F., and this represents the greatest known range of temperature on the surface of the earth. At any one station the range is much smaller, rarely surpassing a half of the above. Man is also perfectly tolerant of the extremes of humidity, provided he can, in the one extreme, have a supply of water to drink, in the other a provision of something to float on. This capacity for toleration enables him to reside in practically any part of the earth's surface, but the toleration has some limitations. Mankind is not entirely tolerant of extreme conditions when long continued. An unusually severe winter is followed by an unusually large death-rate. A residence of a northerner in the tropics to be healthful must be interrupted from time to time by a visit to the mountains or to temperate regions. Another limitation is found in the character of the productions. To permit of continued and profitable residence, these must be suitable to support human life, and in the case of colonies the productions must be not too dissimilar from those of the home country. Mankind is fairly more tolerant of change of climate than of change of diet. Another limitation of the general toleration mentioned is to be found in the causes of disease, such as bacteria. The emigrant may be entirely tolerant of his home bacteria, as vaccination makes us tolerant of smallpox, but he may altogether lack this protection against the bacteria of his new home, and fevers or other endemic diseases and death may follow.

3. While mankind shows great tolerance in general, there is a great difference in individual races, as is shown in their capacity to spread over considerable parts of the earth's surface. The Eskimo leave their hyperborean region with

regret, and suffer greatly from homesickness while away from it. The U. S. Government find great difficulty in transplanting their Indian wards, especially if a considerable change in latitude is attempted. The Indians of the elevated plain of the Andes of Ecuador (elevation 7,000 to 12,000 feet) and those of the hot plains at the base, though they are probably members of the same stock, can not endure transplantation each to the other's climate. Indeed, in the coffee region, intermediate between the two, laborers from the sierra suffer from ague and dysentery and those from the plains from influenza and neuralgia, and neither can do more than remain during the harvest season of three or four months. A longer residence means sickness, and often death. The Hottentots whom Livingstone took with him into more tropical latitudes in Africa proved to be generally unable to stand the change in climate, and in general Livingstone endured these changes better than any of his black companions. On the other hand, the Jews have spread over almost the entire inhabited earth with equal tolerance everywhere, and, as they do not intermix with other races, it is a case of pure racial tolerance. They have multiplied to enormous numbers in the severe climates of Poland and Russia; in Sweden they are said to increase more rapidly than the native population; in Algeria they maintain their numbers; and they form permanent communities in Indo-China. The Chinese live in comfort in all latitudes from British Columbia to Australia. The Spaniards have spread from Louisiana to Chili, and are entirely acclimatized. In some places, as in Guayaquil (lat. 2° 13′ S.), the blood has been carefully preserved from any native admixture, but the acclimatization is none the less complete. The Portuguese live in entire comfort in the tropics throughout the world, and the Arabs are scattered throughout all Africa, wet and dry. The same thing is true, to perhaps a less degree, of the Teutonic stock. The British have peopled the U. S. and Canada (with if anything an improvement of physique), Australia and South Africa. Every port has its Scotchmen. The Dutch Boer of South Africa represents a remarkably persistent colonial stock, and the Dutch endure the East Indies rather better than the British endure Hindustan and Burma. Acclimatization seems to be rather a moral than a physical matter. The weaker and less civilized races have less pluck and courage, become homesick, and are not adaptable to changed conditions. Of the civilized races, it is noteworthy that the two most temperate and thrifty, viz., the Jews and Chinese, are the best colonizers, and something of the same thrift is found in the Spanish and Portuguese. Temperate habits are of the highest importance in the tropics, and it is in humorous allusion to this that the tropical British refer to a drink of spirits as a "peg," meaning a peg in one's coffin. The relative insuccess of the British and the Dutch in tropical colonization is due to their large consumption of liquors, and to their insistence in retaining their home clothing and diet.

4. The spread or subsidence of many diseases may be traced to climatic conditions. The germ diseases which become epidemic in temperate latitudes usually have their homes in the filth of tropical cities stewing under the vertical rays of the sun. Thus yellow fever is at home in the neglected parts of Havana, La Guayra, and Vera Cruz, and spreads northward in favorable summers and autumns, reaching Memphis, Tenn., or Cairo, Ill. The cholera is at home in tropical Asia, and in favorable seasons, spreading northward and westward, it passes through Turkey and Russia, and then spreads along commercial lines through the temperate world, where the germs are carefully preserved in warm houses through the winter to spread in the open air in the next summer.

Climatic extremes also cause sickness and death indirectly. A drouth condenses the drinking-water and increases the power of its impurities, thus producing dysentery, typhoid fever, and similar illnesses. Carried further it becomes a famine, and causes death by famine fever and other diseases of the same ilk, as well as by starvation. Rigorous climates cause people to herd together, and thus permit the spread of consumption, the germ of which is so delicate that it can pass from one to another only under the most favorable circumstances. Hot streets and hurry combined cause sunstroke, and the contrast between overheated houses and extreme cold outside brings on colds, catarrh, pneumonia, and a host of similar ills.

On the other hand, climate suppresses diseases and heals them. The approach of winter suppresses yellow fever and causes cholera to subside. Many climates are healing for the diseases of other climates. Southern California and Western Texas, and the region between them, Colorado, Northern Minnesota and North Dakota, the Adirondacks, and Western North Carolina, are all well known as resorts for the cure of consumption. Florida, and indeed the whole Gulf coast of the U. S., is a place of refuge from the ills of winter. Southern France, Algeria, the Riviera in Northern Italy, and Egypt, are celebrated as climatic health resorts in their season.

5. Climate makes a deep impress on man socially and intellectually. The family is the fundamental unit of social life, and its unity and coherency is largely a matter of climate. Thus the patriarchal family is a result of nomadic life, and the latter depends on climate as one of its essential elements. The cool, temperate climates give rise to homes of the Anglo-Saxon type, while arctic climates cause the association of a larger number of people of different families, giving occasion to communal houses. The prevailing winds and great ocean currents have given direction to conquest, commerce, and discovery. Commodore Maury's study of the climate of the ocean surface enabled him to improve the courses for ships between frequented ports, and gave these an economy of time in each voyage. Climate also determines the character of dwellings, which, beginning in the tropics with open, flimsy, single-storied structures, gradually expand with increase of latitude until the enormous "sky-scraper" is reached, inclosing in its walls a whole village, and made compact for economy of heating, lighting, and access, as well as economy of ground rent. With greater increase of latitude the dwellings dwindle, until far above the Arctic circle the final form is found in a low, tight, solid, hemispherical shell of ice, approached on hands and knees through a long, low, winding, covered passage. Architecture and other branches of engineering are especially dependent on climate for the varied forms their structures take.

Through the channels already mentioned climate affects the mind and soul indirectly, but it also has direct influences of the highest importance. The myths of the childhood of races often admit of purely climatic interpretations. What may be called atmospheric effects, including both climate and weather, comprise a large part of folk-lore, and pervade poetry, especially the poetry of races in their youth, as the *Vedas*, the *Iliad*, the *Kalewala*, and the *Shah-nameh*. The effect of climate on the disposition is familiar over the most of the northern hemisphere in the contrast between the more serious, laborious, and determined northerners and the more genial, leisure-loving, and diplomatic southerners. Whether we compare Scotch and English, Briton and Gascon, Catalonian and Andalusian, Lombard and Sicilian, and North and South German, Russian, or Chinese, the contrast always exists in popular estimation, and it is not entirely lacking in the U. S., though heredity, slavery, the civil war, and migrations of northerners southward have masked it. And this contrast in disposition carries with it differences in character and moral force. The greater labor in higher latitudes necessary to the support of life and to obtaining comforts, and due to the stronger contrast of the seasons, brings with it a stronger will, a more powerful frame, and a greater capacity to endure severe privations; causes money and power to accumulate in the hands of the northerners, and these cause the apparent paradox that the laborious climates yield men of the leisure necessary for a distinctly intellectual and artistic class. The conquering races have usually come from the north. From the southward migration of the early Aryan stock, wave after wave of northern peoples have swept over the lower latitudes, until the last wave has swept past the equator and fairly taken possession of the entire southern hemisphere.

6. While climate, as already pointed out, has had perhaps a formative influence in the lapse of ages on man's physical frame, its immediate and direct effects are of quite subordinate importance. The black, yellow, copper-colored, and white skins, with the other differences which go with them, are rather racial characters than climatic variations. The Negro was the same in ancient Egyptian times as now, and he holds his characters from the Sudan to the Cape of Good Hope, from Liberia to Australia, and from Canada to Brazil. Adjoining tribes offer far greater differences than those due to transportation to America and two centuries of residence there. Migration to hotter climates induces languor and lack of energy, as when the Vandals settled in what is now Tunis, and exposure gives a bronze to the skin which may become hereditary; but these never change the white

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man into the Negro, nor does residence in the Northern States and Canada perform the reverse. In the adaptation of all the functions to climatic conditions certain minor characters are induced which may be readily observed. For instance, the tropical diet includes little fat, the Arctic consists almost entirely of fat. Mountaineers are more robust and hardy and less sensitive to changes of temperature than dwellers on the plains. For residents of arid regions the skin becomes filled with fine wrinkles, the voice is sharpened, the nervous system is affected by the constant stimulus on the skin, and they are more irritable and alert; while for residents in wet regions the skin is smooth, the voice is softened, the nerves are less stimulated, and they are more even-tempered but more lymphatic. These characteristics are not very deep-seated, and tend to reversal on change of climate. Man has gradually withdrawn himself from the direct influence of climate.

7. The reverse problem of man's influence on climate has been much discussed, but no generally accepted conclusions have been reached. There is no doubt as to man's influence in a small degree and to a very local extent, but to such questions as these, "Has the climate of Palestine changed greatly in 3,000 years, and is this change due to man?" very diverse answers are given by serious students of the subject. It may be safely admitted that to a small degree and close to the earth's surface such human operations as the cultivation of the fields, the clearing of forests, the drainage of marshes, and the conservation of natural waters may effect climatic changes; but we must also admit that in the presence of the great operations and changes of the atmosphere his pigmy efforts are without appreciable effect. The best discussion of the subject is that by G. P. Marsh, in his *Man and Nature*, afterward revised and issued under the title of *The Earth as Modified by Human Action*.

Climate and Other Forms of Life.—The relations of animals and plants to climate form a topic of very great importance in theories of evolution and in agriculture, but it is too extensive a subject to treat in full. A few of the salient facts will be pointed out.

Animals are more independent of climate than plants, because the former are generally capable of locomotion, while plants can not escape from unfavorable conditions which may surround them. The amount of tolerance of climatic change by animals decreases on the whole with decrease of rank, as has already been found to be the case with man. The medium also plays an important part. Fish are very sensitive to changes in the temperature of the water, and birds and insects living in the atmosphere and with bodies more completely permeated with the air are less tolerant than mammals which are confined to the surface. Tolerance is also a matter of species. Some species range over enormous regions, while others are confined to very limited districts. Thus the leopard ranges over the whole of Africa and over the south of Asia to East China and Borneo, while a certain species of the ibex is confined to the Pyrenees. The osprey ranges over all the continents southward to Brazil and Tasmania, while a beautiful sunbird is limited to the warmer part of the valley of the Jordan, and a species of humming-bird is confined to the wooded crater of Chiriqui, in Veragua. Range of species, however, depends on many other conditions as well as on the present climate. Thus Madagascar and adjacent Africa differ in their fauna, while Bali and Lombok, only 15 miles apart at their nearest parts, have very different bird faunas. Probably a more powerful controller than climate in the distribution for species is the competition with other forms in the struggle for existence.

Of very great interest are the means provided animals for the protection of the individual and the preservation of the species against injurious climatic effect. Protection from the rigors of winter is afforded by a suspension of vital activity called hibernation for species varying in size from the alligator to the house-fly, and in rank from the bear downward. The covering of the warm-blooded animals, hair, wool, feathers, serves as protection from extremes of temperature and sudden changes. The hairs and feathers are also directed in such a way that in the habitual position of rest on the part of the animal they will shed rain, and in some cases this capacity is increased by a plentiful supply of oil. In many species there is an adaptation in the hairy covering to the season; the hair thins out in warm weather to thicken again in cold.

Many of the instincts of animals have reference to protection against climate. The almost universal migration of birds with the seasons consists in a motion toward the tropics on the approach of winter, and a return to their old haunts with the approach of summer. The migrations of locusts are of different character, but they are seasonal in their time of occurrence, and therefore climatic directly or indirectly. The habits of animals are also largely controlled by climate. Numerous species lay up during the favorable seasons stores of food which can be used in unfavorable ones. When the direct rays of the sun are hot, animals remain generally under cover in the warmest part of the day, and become more or less nocturnal. Death Valley of California has a considerable fauna, but it is so completely nocturnal that an elaborate exploration was required to discover it. Tropical forests are very silent early in the afternoon, but they become very vocal in the early evening and at night with the cries of animals of all degrees.

Most animals are capable of flourishing under a much greater range of the climatic elements than that found in their habitats. Parrots will live and multiply in the English climate without protection, as has been proven in Norfolk. That they do not take possession of the woods is due to the competition of other animals rather than to climate. Many tropical birds live in apparent comfort in open aviaries in temperate regions even when the temperature falls to zero or below. The horse and domestic fowl, both natives of very warm climates, flourish with little protection over almost the entire habited parts of the globe. There are, however, some interesting cases of lack of tolerance of climatic change. The yak of Tibet thrives in some parts of Europe, but can not endure the plains of India. The Newfoundland dog will not live in India. Insects are often confined within narrow limits of temperature, and snakes, common in the tropics, decrease rapidly with increase of latitude, disappearing in lat. 62°. With climate certain changes often take place in the animal. In Angora dogs and cats have fine fleecy hair. Sheep transported from temperate climes to the West Indies undergo a change in the character of their wool, but it takes three generations to complete it. English oysters transported to the Mediterranean alter their mode of growth, and form prominent diverging rays like those on the shells of oysters native to that sea. Geese transported to Bogotá were at first quite infertile, but by degrees improved, until at the end of twenty years the product in eggs was as large as in the home climate. It is also found that in introducing domestic animals or plants into new climates it is well to make an intermediate station of acclimatization. Sheep bred at the Cape of Good Hope do much better in India than those brought directly from Great Britain.

In the case of plants the relations to climate are still closer. The range of species through climate, the widely differing tolerance of different species, the appliances for protection against climate, the subservience of plant-life to the seasons, and the phenomena of acclimatization, are of the same character qualitatively in plants and animals, but more marked in quantity in the plants.

The relations of the phenomena of animal and plant-life to the seasons, the advent of birds, their nesting, the hatching of the young, and the departure toward the tropics, the sprouting of the herbs or appearance of leaves on the tree, the flowering and fruiting, form a series of phenomena which are grouped together under the name of *phenology*. The phenology of plants has been an especial object of study, and the problem to solve can be stated as follows: To express in a simple mathematical form the relations of temperature to the different stages of plant-growth. The initial temperature—that at which vegetable life begins to stir after the winter sleep, the buds to sprout, and seeds to germinate—is generally put at 6° C., or 43° F. The relations to temperature of the stages following this have been variously expressed, but none of the methods is entirely satisfactory. The method most employed is that of accumulation of temperatures after sprouting—that is, the surpluses to temperatures over some selected one are added up. The selected temperature may be the initial above mentioned or may be the mean temperatures for the days observed. The latter is used to give some idea as to whether crops are advanced beyond or retarded behind their usual state at the date employed. The temperature at which the plant does its best is called the *optimum*, and this differs for different species. Many studies of the advance of flowering, leafing, or other stages of plant advancement have been made in Europe and charted, with a long series of interesting and valuable conclusions; but in general it may be said that in phenology observation is far ahead of theory.

The prevailing winds play an important part in the dispersal of plants by the transportation of the entire plant or of the seeds. Myriads of minute organisms, mostly low forms of plant-life, are transported bodily in this way. More than 300 species of diatoms have been found in deposits left by dust-storms. In some cases the plant is transported as a whole even when of large size. The tumble-weeds of the Western plains of the U. S., when mature, loosen their hold on the earth and are carried forward by the wind in a compact ball, 2 or 3 feet in diameter, scattering their seeds as they roll. They continue their journey to great distances, until they finally come to rest against a rock or in a ravine or stream. The so-called Russian thistle, recently introduced into the Dakotas, makes a new form of tumble-weed, and is spreading eastward with considerable speed; but, if not sooner rooted out, it will be stopped by the line of forests on the upper Mississippi and Red river. More often than the plant as a whole, the seeds are made with reference to easy transportation by the winds; and nature takes many methods to effect this. One of the most effective is that employed in the thistle, and one of the most elaborate is that of the common dandelion.

Plants are especially sensitive to the climatic element called humidity. Vegetable life of all grades attains its greatest development, other things being equal, where the humidity is greatest. The tropical forests of the valleys of the Amazon, of the upper Congo, and of the Brahmaputra, are in regions of great humidity; and on the west coast of the American continent, in Alaska and Chili, the heavy rainfall in high latitudes pushes the region of great forests into high latitudes, well toward the polar circles. On the other hand, in arid regions plant-growth is usually small and the number of forms limited, while at the same time these forms take on special and remarkable shapes, and assume a series of surface structures of defensive order to a degree not found elsewhere. The yucca, the century-plant or maguey, the cactuses of unique form and clothing, are typical of American arid or semi-arid plants, while plants of other families, but similar in form and surface, take their place in other arid regions. The plants of arid regions are usually hairy, woolly, thorny, spiny, or covered by fine prickles, primarily a protection against enemies, but indirectly climatic. It has been suggested that the innumerable spines and prickles of the cactuses also play some part in protecting from the burning rays of the sun through the diffractive phenomena occurring about slender bodies.

The mutual influences of forests and climate have been much discussed. The interior of the forest is undoubtedly cooler and its climate milder; the relative humidity is undoubtedly greater therein and the moisture is conserved; the evaporation is decreased both by the forest and by its litter; the ground underneath is kept more moist and springs therein are conserved; the outflow of water is made more regular and the snow within is more slowly melted, thus preventing dangerous floods; moreover, the roots hold the soil together, thus preventing it from being carried down mountain-slopes and overwhelming the cultivable fields below. These are all conclusions which are generally accepted. Forests also serve as wind-breaks for open regions about or within them; but that they increase the fall of rain over their area, or the intensity or frequency of rainfall, or in any way guide, attract, or repel local storms, are conclusions not yet universally received by competent judges. A strong case can be made out for each one, but it is not yet in any one strong enough to carry the matter into the region of certainty.

Climate in Physiography.—Physiography is a description of the earth's surface, with an account of the causes which produced the structures found on it. Among these causes are to be found the elements of climate in varying degree. Temperature appears in the freezing and thawing of standing and flowing waters, in permanent snow and ice, in questions relating to the paleocrystic sea and to glaciers, in the ocean currents and in the weathering of rocks and soils. The wind is important in consideration of loess and of waves. Humidity determines the occurrence of arid and semi-arid regions, while on precipitation depend the multiple problems of erosion by water, the balance of seas and lakes, the fluctuations of rivers, and the occurrence of floods. All these climatic elements appear as causes in physiography. They interact in such a way that each enforces the work of the others. Their work has been going on throughout the history of the globe, and to them is largely due the sculpture of the earth's surface. The operations of heating and freezing, wetting and drying, weathering and erosion, have not only gone on formerly; they are still going on, though the rate of change may be much less than formerly.

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Mark W. Harrington.

Climate, in relation to medicine:

I. *Climate a Cause of Disease.*—A study of vital statistics shows that many affections are directly caused by the unfavorable influences of the various elements of climate upon the human organism. While man is not alone in his susceptibility to these changes, his higher organization has made it possible to differentiate more closely in his case whatever alterations occur. The unfavorable effect of increased or diminished atmospheric pressure, of heat and cold, of moisture and dryness and alterations in the quality of the air, is most conspicuous in affections of the lungs and air-passages. The most serious of these is phthisis. Phthisis or consumption differs widely in its degree of prevalence throughout the world, among the various States and Territories in the U. S., in counties in the same State, and even in the several wards of a city. In Europe it attains its greatest prevalence in Austria, Hungary, and Germany. The Austrian mortality from phthisis, 1882–86, was 13·26 per cent. of total deaths, or 3,839 per million inhabitants. In the U. S. the rate in 1880 was 12 per cent. of total deaths, or 1,472 per million inhabitants, ranging from 20 per cent. in Vermont to 2 per cent. in New Mexico. The climate of the North Atlantic coast States is especially unfavorable for persons who contract tuberculosis; the influence of cold, associated with dampness of the air and soil, and the changeable meteorological conditions due to the frequent passage of storm-centers down the valley of the St. Lawrence, combine to render pulmonary disease in this portion of the U. S. exceedingly common. The South Atlantic and Gulf coasts

and the northern portion of the Pacific slope share, although to a less extent, the same atmospheric humidity and clouded skies, and yield a death-rate from phthisis far in excess of what is experienced in the interior Western plains and plateaus, where dryness of air and soil and an enormous preponderance of sunshine over cloud are hostile to the development of the tubercle bacillus.

Bronchitis, pneumonia, and pleurisy are distinctly cold-weather diseases. The areas of greatest prevalence of pneumonia in the U. S. are Northwestern Louisiana and Arkansas, the State of Nevada, and the western portions of Colorado and the Dakotas. Although altitude does not appear to be a factor in the production of pneumonia, the seasonal relations of the disease are well recognized, for it is four times as frequent in March and April as in July and August. Long-continued cold raises the mortality from pneumonia and bronchitis more than lower temperature lasting a shorter time. The dense, smoky fog occurring in England in conjunction with severe cold is invariably followed by increased mortality from these affections. Diphtheria and croup, pathologically identical, prevail more in rural districts than in cities, and are more strongly influenced by local climatic causes, such as soil-moisture due to imperfect drainage, than by general climatic conditions. Scarlet fever, puerperal fever, erysipelas, and cardiac rheumatism exhibit a striking uniformity with respect to seasonal relations. It has been demonstrated that years of scanty rainfall in England have been coincident with or followed by a rise in the number of deaths from these diseases, while excess of rain corresponds with the periods of greatest immunity. This is in accordance with our knowledge of the manner of the diffusion of affections of this class. During rainfall the floating matter in the air is beaten to the earth, and there retained until the surface dries; it is then widely disseminated by the currents of the air.

Diarrhœa and dysentery prevail in hot weather. Twelve times as many deaths occur from these diseases during July or August as in February. Cold and wet summers check the prevalence of these diseases. Dysentery is not a disease which is caused by heat alone, but it is believed to be a communicable zymotic disease which thrives best in hot weather, and the organisms of which seem dependent upon prolonged high temperatures for their activity.

Malarial fever is a distinctly climatic disease. It prevails in its characteristic forms at low altitudes and in hot climates. Wherever the requisite conditions of water, heat, and vegetation are found in connection with the soil containing the organisms, malarial disease is possible of development. The entire coast-line of the Gulf of Mexico and the Caribbean Sea presents these favorable conditions, and more virulent types of malarial disease are here met with than in any other portions of America. While a disease primarily of low altitude, it is believed to be identified in a modified form with an affection met with in the mountainous region of the Western U. S. termed "mountain fever." There is from year to year a wide variation in the prevalence of malarial disease at any given place.

Yellow fever, Chagres fever, jungle fever, and allied fevers originate in the torrid zone, but may be imported into temperate climates. The occurrence of frost invariably terminates an epidemic of yellow fever.

Affections of the nervous system are frequently aggravated by climatic agencies. Pain has a tendency to increase upon the approach of storms; neuralgic attacks are thus seen to bear a close and direct relationship to storm-tracks. Excessive cold and wind provoke pain. Attacks of chorea are far more prone to occur in the spring than at any other seasons, and the frequency of attacks is directly related to the passage of storm-centers. Infantile paralysis usually originates during hot weather. Apoplexy does not appear to bear any relation to temperature. Tetanus in the new-born, now demonstrated to be dependent on a bacillus, is common on the South Atlantic coast of the U. S., the West India islands, and in the northern seaports of South America.

Hepatic disorders are common in hot countries, abscess of the liver frequently causing death in Europeans who visit India and fail to adopt the simplicity of life, particularly with regard to food and drink, demanded in a tropical climate.

Diseases of the circulatory system are decidedly influenced by changes of altitude. In persons with valvular disease or dilatation of the heart and in all cases of atheroma, especially in the aged, removal to an elevation is attended with danger directly proportional to the degree of altitude attained. On the other hand, serious results attend subjection to increased atmospheric pressure. Those who work in caissons are liable to a form of paralysis attendant upon a too rapid transition from an artificial climate of high atmospheric pressure to that of the sea-level.

II. *Climate Favoring Recovery from Disease.*—For at least 2,000 years the value of change of climate has been recognized in the treatment of disease. The Romans sent patients with ulcerated lungs to Libya, and we are informed that by breathing the balsamic effluvia of the pines with which the country abounded they were said to have lived many years freed from their complaints. Change of climate has a powerful effect on both mind and body; in drawing inferences as to effect of a certain climate in a particular case, all the associated conditions, such as change of scene, diet, and personal associates, should be given their respective values. On the other hand, the best climate in the world may be futile if suitable food and shelter and attendance are not obtainable.

The principal diseases amenable to climatic treatment are phthisis, bronchitis, laryngitis, asthma, hay fever, catarrhs, dyspepsia, Bright's disease, melancholia, hypochondria and insomnia, and various forms of nervous fatigue, as well as convalescence from many acute diseases.

It is quite as desirable to seek a climate for the prevention of tuberculosis as for its cure. For consumptives the best climate is that which combines dryness, warmth, and the greatest proportion of clear days. Local conditions, such as a sandy soil and an atmosphere purified by passing over surrounding tracts of evergreen forests, may compensate to some extent for the lack of either of these characteristics. It is not absolutely essential that the locality should possess a high altitude, nor, on the other hand, need the climate be an entirely equable one. Great diurnal and annual ranges of temperature are found in the larger number of places where experience shows that phthisis is least prevalent and least likely to lead to a fatal termination.

The climates best suited to consumptives in the eastern hemisphere are those of Algiers, Morocco, and Egypt, the plains of Tartary, and the table-land of Persia. In the western hemisphere the best regions are those adjacent to the Rocky Mountains in the north and to the Andes in the south. As a rule, the climate exercises a more controlling influence in passing in a southern direction. In the U. S. favorable locations may be found in Montana, Idaho, and Wyoming, Utah, Colorado, Southern California, Arizona, and New Mexico. The last four of these furnish by far the best accommodations for invalids, and enjoy a wide reputation as health resorts. The Adirondack Mountains in New York and the mountains of Western North Carolina attract many by reason of their advantages for consumptives. Although the rainfall and humidity are greater than on the western plains and plateaus, much can be accomplished in the early stages of phthisis toward arresting and even curing the disease. The necessity of supervision and protection of patients from the indiscretions due to changes of weather, renders it possible to obtain much better results in sanatoriums than outside of them. To get the best influences of climate the open-air method of treatment, by which patients are gradually accustomed to spend a large portion of the time out of doors, should be adopted. By means of suitable shelter and clothing this may be carried out despite inclement weather. See CONSUMPTION.

In Colorado and Southern California, and in the high table-land of Mexico, changes of weather do not occur with such frequency as near the Atlantic coast, and out-of-door life is more readily enjoyed. The lofty plains of Honduras, San Salvador, and Costa Rica share with the table-land of Mexico a climate especially favorable for consumptives. The disease is said to be almost unknown in Bogotá, the mountainous region of the Argentine Republic, Peru, and Bolivia.

Insular climates and sea-voyages do not yield such gratifying results as those obtained in inland climates.

Bronchitis, especially if associated with much irritability of the air-passages, is usually relieved by moist coast climates. The dry Western plains are frequently rendered unfavorable by reason of violent storms of fine dust, often of an alkaline nature, filling the air and exciting great irritability of mucous surfaces. For this reason catarrhal affections are common in the Western States and Territories. Laryngitis for the same reasons requires a sedative, moist climate.

Asthma, not dependent on cardiac disease, is usually re-

lieved by residence at an altitude of from 5,000 to 8,000 feet. Hay fever is likewise avoided by elevated climates in which vegetation is scarce. Many find relief in the Rocky Mountains, portions of the White Mountains, or at the sea-level in those islands lying near the coast, yet distant sufficiently to be free from the offending vegetable products.

Gout and chronic rheumatism require a mild, equable climate, free from dampness. The sand hills of South Carolina and Georgia, the dryer portion of interior Florida, and San Diego in Southern California, present favorable conditions.

Disorders of the digestive organs, particularly cases of nervous dyspepsia, are frequently much benefited by change of climate. Warm, mild climates are to be chosen; cold and damp are particularly injurious to dyspeptics, aggravating their liability to cold hands and feet.

Warm, equable climates are also the most favorable for relieving acute and chronic Bright's disease. Exposure to wet and cold, and climates where rapid changes occur, lead to the production of this class of diseases. Warm seashores, such as those of Southern California, are advantageous.

For cases of insomnia, melancholia, and hypochondria, a change of climate may be of advantage. Insomnia usually vanishes upon going to the seashore, but often proves troublesome for a while in those who remove to a high altitude. Degenerative diseases of the nervous system are usually unfavorably influenced by a high altitude. Hypochondriacs are often benefited by travel. Camp life sometimes yields good results, especially in despondency the result of business anxiety. GUY HINSDALE.

Climatography and **Climatology**: See CLIMATE.

Climax [from Gr. κλῖμαξ, ladder]: a figure by which several propositions or several objects are presented in such an order that the proposition or object adapted to produce the least impression shall strike the mind first, and the others rise by successive gradations of impressiveness. A sentence in which the order is reversed is called an *anti-climax*.

Climbers (in ornithology): See SCANSORES.

Climbing Fern (*Lygodium palmatum*): a rare species of fern of the family *Schizæaceæ*; remarkable for its habit of climbing or twining upon shrubs and weeds. It occurs in the U. S. from Massachusetts and New York to Kentucky and Florida.

Climbing-perch: See ANABANTIDÆ.

Climbing Plants, or **Climbers**: those plants which support themselves upon rocks, walls, buildings, other plants, etc. They have weak stems which are unable to bear the weight of their foliage and fruit, and they trail upon the ground unless they find some support. They use various devices. Thus the morning-glory twines its stems tightly around suitable objects; the ivy sends out its innumerable roots from its stem, and these insinnate themselves into cracks and crevices. The vine twines certain special branches (tendrils) about the twigs of other plants, the clematis uses its leaf-stalks for the same purpose. Some plants again use their spiny leaves and smaller branches for lifting themselves, the spines catching upon the swaying branches. Darwin has pointed out that the free ends of many climbing plants, as in the morning-glory, are continually moving about with a swaying or somewhat circular movement (known as *nutation*), until they strike an object about which they may coil. See PHYSIOLOGY, VEGETABLE. C. E. B.

Clinch River: a stream which rises in the southwest part of Virginia; flows southwestward, and enters East Tennessee. Pursuing the same general direction between two ridges called Clinch Mountain and Powell Mountain, it unites with the Tennessee river at Kingston. The whole length is estimated at about 300 miles.

Clingman, THOMAS LANIER: U. S. Senator; b. in Huntsville, N. C., July 27, 1812; graduated at the University of North Carolina 1832; became a lawyer and settled in Asheville, N. C.; served in both branches of the State Legislature; was sent to Congress in 1843, and six times re-elected; appointed in 1858 to fill a vacancy in the U. S. Senate, and was elected thereto for the term beginning Mar., 1861; withdrew on the secession of his State and entered the Confederate service as colonel, and for three years held the rank of brigadier-general. He measured the highest peak in the Black Mountains, and it was called Clingman's Peak for him, as also is CLINGMAN'S DOME (*q. v.*). His investigations made known the existence of gems and rare minerals, as platinum, corundum, and the ruby, in North Carolina; published a volume of speeches and *Follies of the Positive Philosophers* (Raleigh, 1878). D. at Morganton, N. C., Nov. 3, 1897.

Clingman's Dome: in Swain co., N. C.; the highest peak of the Great Smoky Mountains, between North Carolina and Tennessee. It rises to 6,660 feet above the sea, and is the second in height in the Appalachians. It was named after Thomas L. Clingman, who ascended it in 1858.

Clinkstone: See PHONOLITE.

Clint, ALFRED: landscape and marine painter; b. in London, 1807; pupil of his father, George Clint, portrait-painter (1770–1854); president of Society of British Artists 1869. D. Mar. 22, 1883. His father's reputation grew out of an engraving of the trial of Queen Caroline, into which he introduced portraits of the Kemble family, and after this he became a famous delineator of actors and actresses. Some of his work is in the South Kensington Museum.

Clinton: town of Huron co., Ontario, Canada; on Buffalo and Goderich Branch of Gr. Tr. Railway; 13 miles from Goderich (for location, see map of Ontario, ref. 4–B). It has a collegiate institute, a model school, and churches of six denominations. There are here 2 extensive organ-factories, threshing-machine factory, tannery, 3 planing-factories, flax-factory, fanning-mill factory, large flour-mill, grain-elevator, 2 carriage-factories, 2 salt wells, the headquarters for the Canada Salt Association, and a large number of other industries. The town is lighted by electricity. Pop. (1881) 2,606; (1891) 2,635. EDITOR OF "HURON NEWS-RECORD."

Clinton: city; capital of De Witt co., Ill. (for location of county, see map of Illinois, ref. 6–E); on Ill. Cent. R. R.; 23 miles S. of Bloomington. There are here 6 churches, 2 public schools, railroad machine-shops, electric lights, and waterworks. Agriculture is the chief industry. Pop. (1880) 2,709; (1890) 2,598; (1900) 4,452. EDITOR OF "PUBLIC."

Clinton: city; capital of Clinton co., Ia. (for location of county, see map of Iowa, ref. 5–K); on Ch. and N. W., the Ch., B. and Q., the Ch., B. and N., the B., Ced. Rap. and N., and the Ch., M. and St. P. R. Rs., and on the Mississippi river, 42 miles above Davenport, and 138 miles by railroad W. of Chicago. The river is here crossed by an iron bridge which is about 4,000 feet long, and cost $600,000. The cars of the Ch. and N. W., the Ch., B. and Q., and Ch. B., and N. R. Rs. pass over this bridge. Clinton contains the repair-shops of the railroad company, foundries, sash and blind factories, a paper-mill, eight saw-mills, etc. Pop. (1880) 9,052; (1890) 13,619; (1900) 22,698. Lyons annexed since 1890.

Clinton: city; capital of Hickman co., Ky. (for location of county, see map of Kentucky, ref. 5–B); on Ill. Cent. R. R.; about 200 miles W. S. W. of Louisville. The city has churches of four denominations, two colleges (Baptist and Methodist), creamery, and a roller flouring-mill. It is located in the midst of a rich agricultural region. Pop. (1880) 506; (1890) 1,347; (1900) 1,462.
PUBLISHER OF "DEMOCRAT."

Clinton: capital of East Feliciana parish, La. (for location of parish, see map of Louisiana, ref. 9–E); 32 miles N. of Baton Rouge. A railway 25 miles long connects it with Port Hudson on the Mississippi. The parish ships yearly 30,000 bales of cotton. Pop. (1880) 1,129; (1890) 974; (1900) 960.

Clinton: town; Worcester co., Mass. (for location, see map of Massachusetts, ref. 3–F); on the Boston and Maine and the Old Col. Div. of N. Y., N. H. and Hart. Ry., and on Nashua river; 45 miles W. by N. from Boston and 16 miles N. E. of Worcester. It has manufactures of ginghams, Brussels and Wilton carpets, wire-cloth, machinery, worsted goods, etc. The Lancaster mills of this place employ about 1,500 hands, operating on 1,050 looms, and producing annually nearly 7,000,000 yards of ginghams and plaids. The city has a free library of 17,000 volumes, and is lighted with electricity. Pop., including township (1880) 8,029; (1890) 10,424; (1900) 13,667. EDITOR OF "COURANT."

Clinton: city; capital of Henry co., Mo. (for location of county, see map of Missouri, ref. 5–E); on the Mo., Kan. and Tex., the Kan. City, Osc. and So., and the Kan. City, Fort S. and M. R. Rs.; 90 miles S. of Kansas City. Clinton has colleges for men and women, excellent public schools, potteries, tile factories, iron-rolling mill, flouring-mills, grain-elevators, gas and electric lights, and a street railway. Pop. (1880) 2,868; (1890) 4,737; (1900) 5,061.
EDITOR OF "HENRY COUNTY DEMOCRAT."

Clinton: village; Oneida co., N. Y. (for location of county, see map of New York, ref. 4–H); on N. Y., Ont. and W.

R. R.; 9 miles W. by S. of Utica. It has two seminaries for girls and a large union school and academy. It is also the seat of Hamilton College. In the vicinity are large quarries of good building-stone. There are also various manufactures. Pop. (1880) 1,236; (1890) 1,269; (1900) 1,340.

EDITOR OF "COURIER."

Clinton, DE WITT: statesman; b. in Deer Park, Orange co., N. Y., Mar. 2, 1769; son of Gen. James Clinton, and nephew of Gov. George Clinton. His mother's name was Mary de Witt. Having graduated at Columbia College, New York, in 1786, he studied law, and became in 1790 private secretary to his uncle, then Governor of New York. He was a man of ardent temperament, dignified manners, inclined to reserve, and of noble personal appearance. He married about 1796 Maria Franklin, of New York city. He entered public life as a Republican or Anti-Federalist, and was elected a member of the popular house of the State Legislature in 1797, and of the State Senate in 1798, and soon became the most influential leader of his party in the State of New York. In 1801 he was elected a Senator of the U. S. Prof. Renwick states that he was on all sides looked up to as the most prominent of the rising men in the Union when he was appointed in 1803, by the Governor and council, mayor of the city of New York, which office he held by successive reappointments until 1814. He also served as Lieutenant-Governor of New York for two years (1811–13), and was one of the commissioners appointed in 1810 to examine and survey a route for a canal from the Hudson to Lake Erie. In 1812 he was nominated for the presidency of the U. S. by those who opposed the policy of President Madison regarding the war with Great Britain. He received eighty-nine electoral votes, cast by Massachusetts, Connecticut, New Hampshire, Rhode Island, New York, New Jersey, Delaware, and Maryland, but was not elected. His course and policy at this period offended many of the Republicans, and appear to have impaired his popularity for a time. After retiring from the mayoralty, about the end of 1814, he held no public office for some years. In 1815 he framed and presented to the Legislature a memorial favoring the construction of the Erie Canal, and early in 1817 that body passed a bill authorizing the construction of that canal. He was elected Governor of New York almost unanimously in 1817. In 1820 he was re-elected Governor over Daniel D. Tompkins. As Governor he distinguished himself by his liberal patronage of science and his efforts to promote the education of the people. He was at the same time president of the Board of Canal Commissioners. In 1822 he declined to be a candidate for the office of Governor. He was removed from the position of canal commissioner in 1824, and was again elected Governor by a large majority in the same year. The Erie Canal was completed in 1825, and its opening was celebrated in October of that year, when Gov. Clinton was conveyed in a barge with triumphal demonstrations from Lake Erie to the city of New York. He was re-elected Governor in 1826, and died at Albany before the expiration of his term of office, Feb. 11, 1828. See David Hosack, *Memoir of De Witt Clinton* (1829); James Renwick, *Life of De Witt Clinton* (1840); William W. Campbell, *Life of De Witt Clinton* (1849); and John Bigelow, in *Harper's Magazine* (1875).

J. JAMES R. CROES.

Clinton, GEORGE: fourth Vice-President of the U. S.; b. in Little Britain, Ulster (now in Orange) co., N. Y., July 26, 1739; son of Charles (1690–1773), who emigrated from County Longford, Ireland, to the American colonies in 1729, and was of kin to Admiral George Clinton, who was colonial Governor of New York 1741–53, to whom he was indebted for his introduction into political life. He was an uncle of De Witt Clinton. He practiced law in his youth, and was elected in 1775 to the Continental Congress, in which he did not vote for the Declaration of Independence, considering himself without authority to do so. It was adopted in a special provincial congress July 8, 1776, but he was absent when it was signed, having been called to take command of a brigade of militia. In 1777 he was a delegate to the convention which framed the first State constitution of New York, and with his brother James fruitlessly defended Forts Clinton and Montgomery. He was chosen Governor of New York in 1777, and continued in that office, by several re-elections, until 1795. As Governor he defended the Mohawk valley against the Indians under Johnson and Brant, and the Hudson valley against Sir Henry Clinton; suggested connecting the Mohawk with Lake Champlain by a canal; and marched to suppress Shays's rebellion in Berkshire co., Mass. In 1788 he presided over the State convention called to ratify the Federal Constitution, which instrument he disapproved, because it gave too much power to the central Government. He was afterward the principal leader of the Republican party in the State of New York, and was chosen Governor of that State in 1801. He received fifty electoral votes in 1792 and seven in 1796 for Vice-President of the U. S., and in 1808 received six such votes for the presidency. In 1804 he was elected Vice-President of the U. S. by the Democrats, who elected Jefferson as President; and was re-elected Vice-President in 1808, in which position his casting vote in 1811 defeated the rechartering of the U. S. Bank. D. in Washington, D. C., Apr. 20, 1812.

Clinton, Sir HENRY: an English general; grandson of the Earl of Lincoln, and son of Admiral George, a colonial Governor of New York; b. in 1738. He served in the guards in Hanover during the Seven Years' war, and as major-general at the battle of Bunker Hill June, 1775; led an expedition in 1776 to North Carolina, but it failed to land, owing to the failure of the fleet to co-operate; was driven in June of the same year from Fort Moultrie, in Charleston harbor; served under Gen. Howe from Long Island to Philadelphia; left in command at New York and failed to aid Burgoyne's expedition down the Hudson valley; was appointed commander of the British army in North America in April, 1778. He evacuated Philadelphia in June, 1778, and moved his army by land to the city of New York, encountering disaster at Monmouth on his retreat, and cruelly imprisoned and executed patriots, among them COL. HAYNE (*q. v.*); quarreled with Gen. Cornwallis, neglecting to support his campaign northward into Virginia. He conducted an expedition against Charleston, S. C., which he besieged and took, May 12, 1780, capturing Gen. Lincoln's army of 6,000 men. In Oct., 1781, he sailed from New York with about 7,000 men to relieve Cornwallis, but the latter surrendered at Yorktown before the arrival of Clinton. He was superseded by Gen. Carleton in 1781; was afterward member of Parliament, and became governor of Gibraltar in 1793, where he died, Dec. 24, 1795. He wrote *Narrative of Campaign in 1781 in North America* (London, 1783; n. ed. Philadelphia, 1865), in answer to the strictures of Lord Cornwallis.

Clinton, HENRY FYNES: chronologist; b. at Gamston, Nottinghamshire, England, Jan. 14, 1781; d. at Welwyn, Oct. 24, 1852. Graduated from Christ Church, Oxford, in 1799; tutor to Earl Gower 1803–06; member of Parliament from 1806–26, when he retired to devote himself to the works of his life, the still indispensable *Fasti Hellenici* (3 vols., 1824–34) and the *Fasti Romani* (2 vols., 1851). He also published epitomes of the two larger works. See *Literary Remains of H. F. Clinton* (3 vols., London, 1854); vol. i. *Autobiography*, vol. ii. *Literary Journal* (1819–52.)

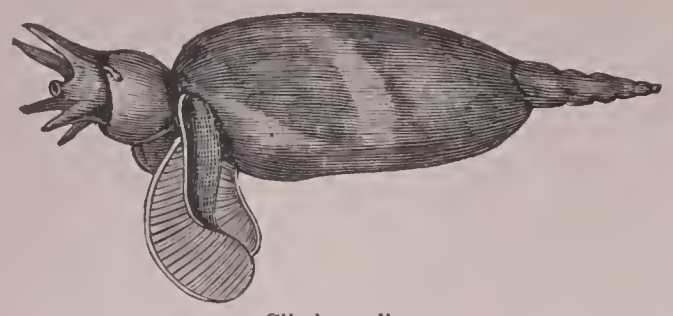
ALFRED GUDEMAN.

Clinton, JAMES: general; b. in Ulster co., N. Y., Aug. 9, 1736; was a son of Col. Charles Clinton, brother of Gov. George, and the father of the statesman De Witt Clinton. With his brother George he marched against Fort Frontenac under Bradstreet; commanded four militia regiments for the protection of Ulster and Orange Counties; became a colonel in 1775, and served under Gen. Montgomery in Canada. He was raised to the rank of brigadier-general in 1776; was compelled to retreat from Fort Clinton, which he commanded, before an assault of the British, after a spirited defense, Oct., 1777; took part in Sullivan's operations against the Indians in New York in 1779, when he carried his flotilla out of Otsego Lake by damming its outlet and riding out on the freshet caused by breaking this barrier, and participated in the defeat of the Indians at Newtown (now Elmira). In Oct., 1781, he assisted at the siege of Yorktown, after which he served in the Legislature and Constitutional convention of his native State. D. in Little Britain, N. Y., Dec. 22, 1812.

Cli'o (in Gr. Κλειώ): one of the nine Muses; daughter of Jupiter and Mnemosyne; presided over history and epics; was represented as holding in one hand a half-opened roll or scroll, and in the other a cithara. She is first mentioned by Hesiodus, and was sometimes portrayed sitting, often with an open chest of books beside her.

Clio, or **Clione**: a genus of molluscs belonging to the group of PTEROPODA (*q. v.*), embracing about a dozen species,

living chiefly in the Arctic and Antarctic seas. They are without shell, have a distinct head with two pairs of ten-



Clio borealis

tacles, and the body pointed behind. *Clio borealis* is from 1 inch to 1½ inches in length, *Clio australis* nearly 3 inches long. These forms occur in immense swarms and in the colder seas, and together with one or two other species form the "brit" of the whalers, the chief food of the whalebone whales, as well as of many other animals. *Clio borealis* rarely appears on the New England coast. J. S. K.

Clis'thenes, or **Cleis'thenes** (in Gr. Κλεισθένης): an Athenian statesman; the grand-uncle of Pericles; lived about 500 B. C., and took a prominent part in the expulsion of the Pisistratidæ. He increased the number of the tribes of Attica from four to ten, and made important changes in the constitution, which he rendered more democratic. He became very popular, and was the foremost Athenian statesman of his time. He instituted ostracism, and was himself the first sufferer from it.

Clith'eroe: a market-town of Lancashire, England; on the river Ribble; 28 miles N. of Manchester, with which it is connected by railway (see map of England, ref. 6–G). The houses are of stone. It is situated at the base of Pendle Hill, which is 1,831 feet high, and near Pendle Forest, which is reputed to be the scene of the exploits of the Lancashire witches. It has the ruins of a castle built in the twelfth century. Here are manufactures of cotton fabrics, and a grammar school founded in 1554. It returns one member to Parliament. Stonyhurst College is 4 miles to the southwest. Pop. (1891) 10,815.

Cli'tus, or **Cleitus** (in Gr. Κλεῖτος): a Macedonian officer, and foster-brother of Alexander the Great, whom he accompanied in his expedition against Persia, and saved his life at the battle of the Granicus in 334 B. C. He enjoyed the favor of Alexander, who appointed him satrap of Bactria in 328 B. C. In the same year a dispute occurred at a feast between them, and Alexander, excited with wine, killed Clitus with a spear.

Clitz, Henry Boynton: general; a son of Capt. John Clitz, U. S. army; b. in Sackett's Harbor, N. Y., July 4, 1824; graduated at West Point in 1845; served with honor in the Mexican war as an infantry officer; wounded at Yorktown, Va., and Gaines's Mill in 1862, and taken prisoner in the latter engagement; served as commandant of cadets and instructor in tactics at West Point (1862–64); became lieutenant-colonel Sixth Infantry, and in 1869 colonel Tenth Infantry. In 1865 he was breveted brigadier-general U. S. army. Retired July 1, 1885. According to the *Army Register* for Jan. 1, 1890, he was last seen at Niagara Falls, N. Y., Oct. 30, 1888.

Clitz, John Mellon Brady: rear-admiral U. S. navy; b. in Sackett's Harbor, N. Y., Mar. 10, 1823; brother of Gen. Henry Boynton (*q. v.*); entered the navy as a midshipman in 1837; retired with rank of rear-admiral Oct. 16, 1883. He served in the Mexican war at Vera Cruz and Tuxpan; was employed during the civil war in command of various vessels of the North Atlantic squadron, frequently in action with batteries on the James river while co-operating with the army in both the Fort Fisher fights, and recommended for promotion by Rear-Admiral Porter in his commendatory dispatch of Jan. 28, 1865. D. at Washington, D. C., Oct. 10, 1897.

Clive, Robert, Lord: soldier and statesman; b. at Styche, near Market Drayton, Shropshire, Sept. 29, 1725. The record of his school-days shows him to have had little fondness for study, but a fertile brain in devising mischief. He went to Madras in 1743, and became a clerk in the service of the East India Company. His work here was so uncongenial that he attempted to kill himself, but his pistol twice missed fire, and he accepted the failure as an omen of future usefulness. War having broken out between the British and French, he entered the service as an ensign in 1747. In this field he found scope for his talents. His military genius and resolute spirit procured his rapid promotion. In 1750 and 1751 he defeated the French at Arcot, the citadel of which he held for eleven weeks with 80 English and 120 Sepoy soldiers against 7,000 native and 120 French troops, and then overthrew his enemies at Arni, Kaveripak, Kovilam, and Chingalpat. He made a voyage to England for his health in 1753, taking with him his wife, a sister of Maskelyne the astronomer. In 1755 he returned to India as governor of Fort St. David. He waged war with success against the nabob Surajah Dowlah, and took Calcutta in 1757. In June of that year, with 3,000 men, he gained a decisive victory over the nabob's army of 60,000 men at the battle of Plassey. For this service he was rewarded with the office of governor of Bengal. He had become immensely rich by alleged imposition practiced on Jaffier Ali, who aspired to become Nawab of Bengal, and then he returned to England in 1760, and was raised in 1761 to the Irish peerage as Baron of Plassey. In 1764 he was again sent to India, with authority to rectify the disorders which prevailed after his departure from that region. He proved himself an able administrator, and restored discipline. He returned to England in 1767. His enemies in Parliament accused him of having enriched himself by a tyrannical abuse of power, and a committee was appointed in 1773 to investigate his conduct. This inquest resulted in his acquittal. He became addicted to the excessive use of opium, and committed suicide in London, Nov. 22, 1774. See Sir John Malcolm, *Life of Lord Clive* (3 vols., 1836); Macaulay's *Essays*; G. B. Malleson, *Founders of the Indian Empire, Clive* (London, 1882).

Cloa'ca [Lat., sewer, connected with *clu'ere*, purge; cf. Gr. κλύζειν, cleanse, Goth. *hlūtrs*, Germ. *lauter*, clean]: the common chamber, opening externally by the anus, which receives the products of the urinary, intestinal, and reproductive organs. This condition is found in some fishes, all reptiles and birds, and in the *Monotremata* among mammals, whence their name.

Cloa'ca Max'ima [Lat., largest drain or sewer]: the most remarkable sewer of ancient Rome, and one of the few now in use. It was completed in 588 B. C. by Lucius Tar-

Mouth of Cloaca Maxima at Rome.

quinius Priscus, the fifth king. (See Tarquinius.) It was first designed to drain the Forum and the adjacent low ground, but was afterward extended to include other localities. From the Forum it passes near the Temple of Vesta, and terminates at the Tiber, where its mouth is still seen. It is built with three thick concentric arches, the inner one 12 feet in interior diameter, and the entire structure being about 32 feet high. The masonry consists of blocks of tufa about 3 feet thick, laid without cement. The sewer was kept flushed by water admitted into it from the aqueducts. Agrippa passed through the Cloaca Maxima in a boat, and Nero caused some of his victims to be thrown into it. Notwithstanding its age of nearly 2,500 years, the structure is still in a good state of preservation. The mouths of two smaller cloacæ are still visible in the river wall near the Cloaca Maxima, one of which is shown on the left in the

illustration. A large number of these smaller sewers were built under the ancient city, and their inspection was one of the duties performed by the censors. See SEWERAGE.

MANSFIELD MERRIMAN.

Clocks: From the earliest period of human history men have sought for means to measure time. For the savage the divisions of time by the sun's rising, setting, and nooning were sufficient, when he could see them. But very early men began to divide the day into several portions, and soon the night also. At first these divisions were of about three or four hours each. After a time the division of the night and the day into twelve hours each was found to be more convenient, and then there came the necessity for means of measuring these divisions of time. The first in use was the dial, which by its shadow on a horizontal plate marked the passage of the hours by the progress of the sun. But as this could only be of service in the daytime, and when the skies were not obscured by clouds, something else was necessary. The hour-glass, which measured time by the flowing of sand through a narrow passage from one spherical vessel into another, and which was so graduated that all the sand would run out from the upper glass in just an hour, was a very good instrument to measure the lapse of an hour, but it could not be depended upon to give the time of day, and required watchfulness to turn it as soon as the sands had all run down. King Alfred's device of twelve candles, graduated so as to burn two hours each, was not much better, and in some respects even more inconvenient. The clepsydra was a step in advance of these. In its primitive form it was simply a jar containing a known quantity of water, which ran out from one or more small orifices in the bottom of the jar at such a rate that the quantity of water in the jar would be lowered to a certain point each hour, and the jar being filled at sunrise every day marked off the hours with tolerable regularity. As glass was not then used for the jar, the only way of determining the time from this primitive form was by looking into the jar or measuring the depth of the water by a graduated stick. In another form of clepsydra the time was measured by measuring the amount of water escaping from the vessel in which the water was kept at a given height. This remedied the defect due to the irregularity in the flow of the water caused by the decrease in pressure as it lowered in the vessel. It is not known just when or by whom these clepsydræ were invented. They are credited to Hermes Trismegistus, and were used by the Assyrians as early as the beginning of the sixth century B. C., were known to the Greeks in the fifth century B. C., and were introduced at Rome about 158 B. C. by Scipio Nasica. Eighteen years later they were improved by Ctesibius, by the addition of wheels which were driven by the water which flowed from the bottom of the jar, and caused the gradual rise of a small figure, thus indicating the time on an index attached to the instrument. Thus improved, these water-clocks have been in domestic use in the East for about 2,000 years, and were used in Europe as late as the seventeenth century. Tycho Brahe for astronomical purposes used a clepsydra, in which he substituted quicksilver for water. In the west of Europe there was a demand for further improvements.

The first of these, which possibly came from the Saracens, and perhaps from their Western empire in Spain, was the substitution of a weight for the water to turn the toothed wheel. It may have been introduced at a still earlier date than this, for Archimedes had discovered the advantage of weights in the turning of small machines some centuries earlier. But after this substitution there still remained the difficulty that the weight was not so regulated as to cause the index to pass over equal spaces of the dial in equal times. How this difficulty was obviated during the Dark Ages there is no means of knowing. There is a record of a clock of very elaborate workmanship having been sent by Pope Paul I. to King Pepin of France in 760, and of another being invented by Pacificus, Archdeacon of Genoa, in the ninth century. The invention of an escapement of some kind is attributed to Gerbert about A. D. 1000. Though rude, it probably answered the purpose, for within the next 380 years tower-clocks of great size were set up in Canterbury Cathedral (1292), in the Abbey of St. Albans (1326), at Genoa (1353), and one which struck the hours at Westminster in 1368. The clock whose construction is best known, and which was undoubtedly the best timekeeper of any of that period, was that made by Henry de Vick, a German, and set up in Paris for Charles V. in 1379. We have deemed the movement of this clock worthy of an illustration (see Fig. 1), as showing what were the methods of constructing a balance and escapement at that time. The toothed or crown-wheel I is the escapement-wheel; the pallets or levers *i h* having beveled edges, and projecting from the suspended upright spindle or vertical axis K M, on which is fixed the regulator or balance L L, give it a vibratory motion, as the motion induced by the weight A in uncoiling the cord and causing the cylinder B to revolve is communicated to the various toothed or cog wheels, and finally to the crown or escapement-wheel, causing them alternately to strike the teeth of that wheel. There would still be an irregularity in these motions, and a consequent defect in the clock as a timekeeper, were it not for the weights *m m*, placed on the balance or regulator, and which, by the distance they are removed from the spindle, increase or diminish the resistance of the pallets to the escapement-wheel. This was the principle on which all clocks were made for the next 270 years, but the English do not seem to have been successful in making good timekeepers till 1540, when one, set up at Hampton Court by an unknown maker, became celebrated for its accuracy. It was not until a century later (some time between 1641 and 1658) that either an English clockmaker named Harris or the Dutch philosopher Huyghens adapted Galileo's discovery of the substantial isochronism of the pendulum-beats to the marking of time by making the escapement or crown-wheel horizontal, instead of vertical, and attaching the pallets to the pendulum-rod. Subsequent improvements were made in the escapement, especially the substituting the anchor escapement for that of Huyghens by Dr. Hooke, 1666–80, and the further improvement of this in. the dead-beat escapement of George Graham, invented in 1700, in which the arms of the escapement are set at right angles, and the outer surface of the pallet B and the inner surface of the pallet C are arcs of circles, of which A, the point of attachment to the pendulum-rod, is the center. This insured great accuracy as timekeepers. Other escapements, as the duplex, detached, pin-wheel, gravity, etc., have been devised, but have not come into very general use, and are not, perhaps, preferable in all respects to Graham's. Other improvements have been attempted in the pendulum itself. These have been mainly in the matter of compensation for the expansion and contraction of the pendulum-rod by heat and cold. Graham's mercurial compensation pendulum, invented in 1715, in which a tube or ball having mercury in it was substituted for the bob of the pendulum, and the gridiron pendulum of Harrison, invented in 1726, composed of five rods of steel and four of brass, which, expanding differently, compensated by their action for the changes induced by heat or cold, were the principal of these.

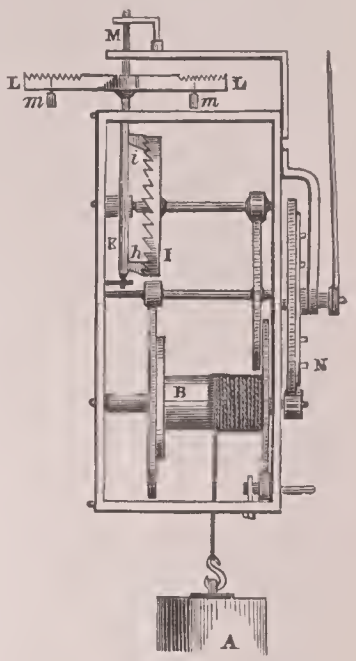


FIG. 1.

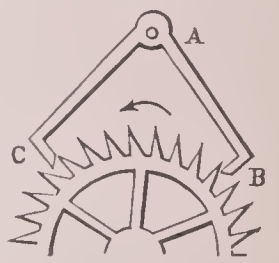


FIG. 2.

The clockmakers of the U. S., retaining the dead-beat escapement, made the pendulum-rod of wood and covered it with gold-leaf; and this has been found to be as effectual a contrivance as either the mercurial or gridiron pendulum. In the cheaper clocks, where absolute accuracy is not so important, they have obtained substantial accuracy by turning a screw thread upon the lower end of the pendulum-rod, and putting upon this a nut, which, while it holds the sliding pendulum-bob in place, can by one or two turns regulate it in accordance with the temperature of the season. To accommodate what is known as the cycloidal curve in the arc described by the pendulum, its attachment to the pinion moved by the weights, or afterward by the spring, was made by hammering its upper end into a thin slip of steel which passed into a slit in the pinion, and was held in place by two little cheeks or projections at the top. While the workmanship was gradually perfected, the prin-

ciples on which clocks were made in Great Britain, France, and Germany did not change, except in a single particular—that of a substitution of steel springs for weights—from the beginning of the eighteenth century to the present time. Even now, very considerable numbers of these brass-wheel clocks, with weights, and standing in cases 6 feet high, are still made, and some of them are still exported to the U. S. The manufacture of this description of clocks was introduced into the U. S. before the Revolutionary war, but comparatively few are made, though these were of good workmanship.

The tall, old-fashioned clock, with its long pendulum and heavy weights, seems very different from the little "nutmeg lever," but both depend upon the same principle.

Eli Terry, of Windsor, Conn., was probably the first clockmaker in the U. S. His clocks were made entirely of wood. They were good timekeepers, and were sold in large quantities by peddlers. In 1807 he undertook to make 500 clocks at one time, but overstocked the market and reduced the price from $25 to $15, and at last to $10. It was not till 1837 that brass-wheel clocks were made in the U. S. From 1806 to 1815 the number of clockmakers largely increased (Messrs. Seth Thomas, Silas Hoadley, Herman Clark, Asa Hopkins, and others engaging in the business), and many thousands were made. In 1814 Mr. Terry invented what was known as the "short-shelf clock," in which, by a change of arrangement and smaller weights, the pendulum being brought forward and greatly shortened, and the weights being carried and run on each side, the whole was reduced to a more compact form, and clock and case were sold together for a moderate price. This modification was adopted by other manufacturers, and soon became general. These clocks were made with wooden wheels, but after the introduction of rolled brass into the market, machinery was invented by which the blank wheels of the clock could be struck out of the rolled brass with a die, and the teeth afterward cut by machinery, and the brass-wheel clocks could be made cheaper than wooden ones.

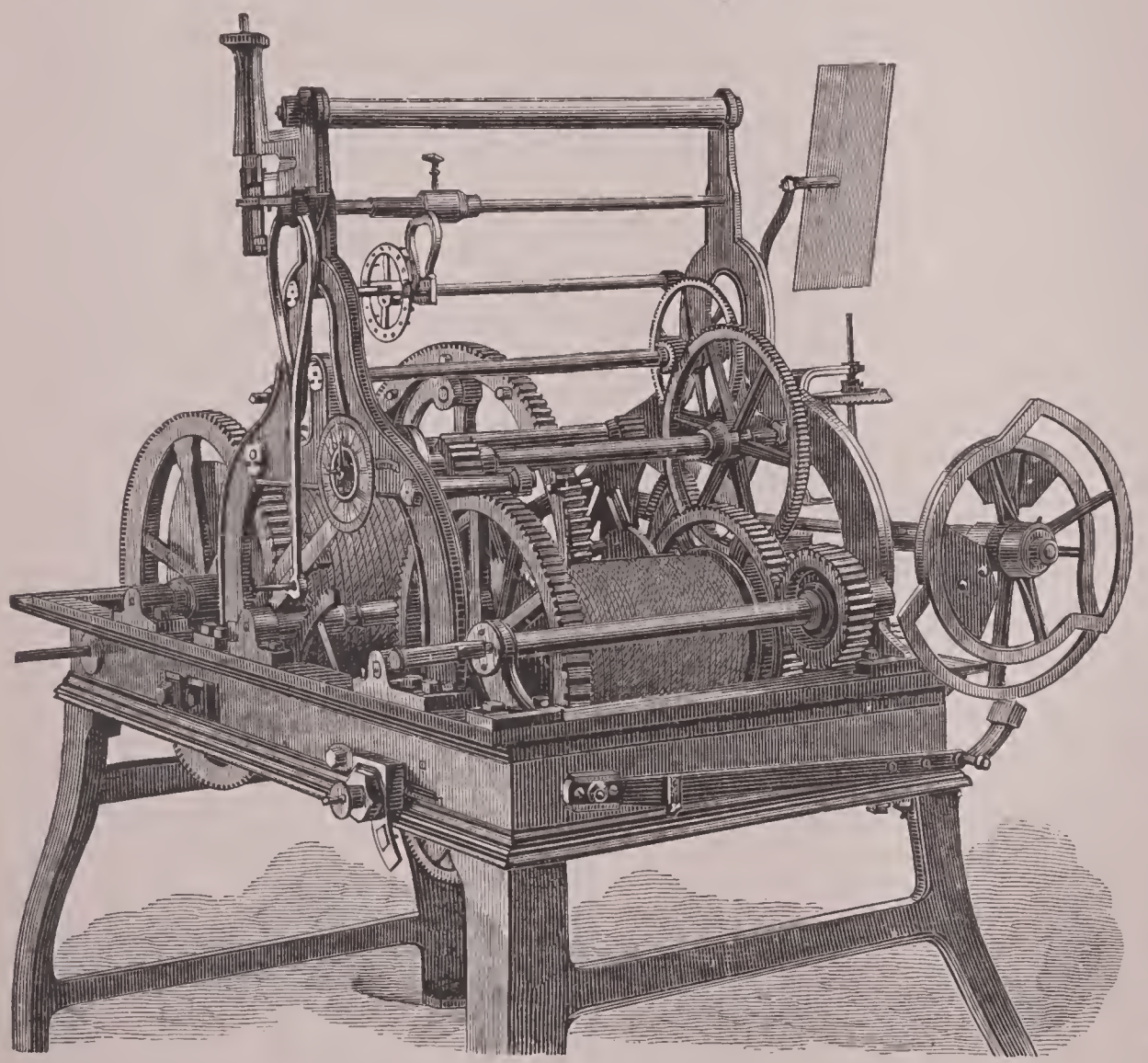


Fig. 3.

The next improvement was the substitution of coiled steel springs for the weights, thus assimilating the clock to the watch. This has been done in Europe for two hundred years, but only with the most costly parlor clocks, and the springs used were equal in quality to the best watch springs. Of course, this would not answer for cheap clocks for the million, and various experiments were tried with cheap springs. Coiled brass springs were used, but these soon lost what little temper they had, and so did their purchasers. An elliptic steel spring connected with a fusee was tried, but with no better success. Finally, a new and completely successful process of making a superior steel spring was invented in the U. S.; and the springs thus produced have for many years been sold at a price compatible with their use in cheap clocks. This, together with the cheapening by machine-labor of the production of all parts of the clocks, has led to their very general introduction, and to the reduction of the size of clocks, till now twenty-four of the smallest sized pendulum clocks can be packed in a box of a cubic foot in dimensions. One result of this reduction in the size and price of clocks was an enormous increase in the demand for them, both in domestic and foreign countries. Clocks to run thirty hours were made which sold in quantities at $9 the dozen, and a fair eight-day clock at $48 the dozen. Since then many improvements have been introduced, and clocks of all kinds made in the U. S. are now exported very largely to all the countries of Europe, to China and Japan, India, Western Asia, Egypt, South Africa, Mexico, and South America.

Turret-clocks, which were formerly imported, are now made of excellent quality. Fig. 3 represents the movement of a Hotchkiss tower-clock erected in Steubenville, O., and a similar one is on the City Hall, New York. These clocks are remarkable for their accuracy and the perfection of their mechanism, and have proved admirable timekeepers. They have the pin-wheel escapement (very clearly delineated on the second and third cross-bars), the pins having an ingenious contrivance of a shoulder to keep the oil upon them; and also a very remarkable arrangement (at the right of the figure) for regulating automatically the gas-jets which illumine the face of the clock, so that they may burn any required number of hours. Regulators, formerly imported in all cases, are now made of the best quality by several firms in the U. S. The wooden pendulum-rod, covered with gold leaf, which is one of the characteristics of these regulator clocks, is, it is believed, the invention of Silas B. Terry, a son of Eli, already mentioned. The French parlor or mantel clock, a costly and beautiful ornament to the homes of the wealthy, had so long been imported that it was considered hopeless to attempt to compete with it; but since 1866 these articles have been manufactured in the U. S., and in the perfection of their workmanship, their accuracy as timekeepers, and the elegance and variety of their patterns, as well as in their moderate price, compete so favorably with the foreign parlor clock that they have well-nigh driven it from the market. Of other special kinds there may be named the calendar clock, first successfully made for the general market in the U. S., which gives the day of the week and month, and sometimes the changes of the moon; the marine clock, a watch on a large scale, which, properly made, is an excellent timekeeper; the railway clock, which is of similar

but somewhat more delicate construction, and with a compensating arrangement for the jar to which it is exposed, etc. The

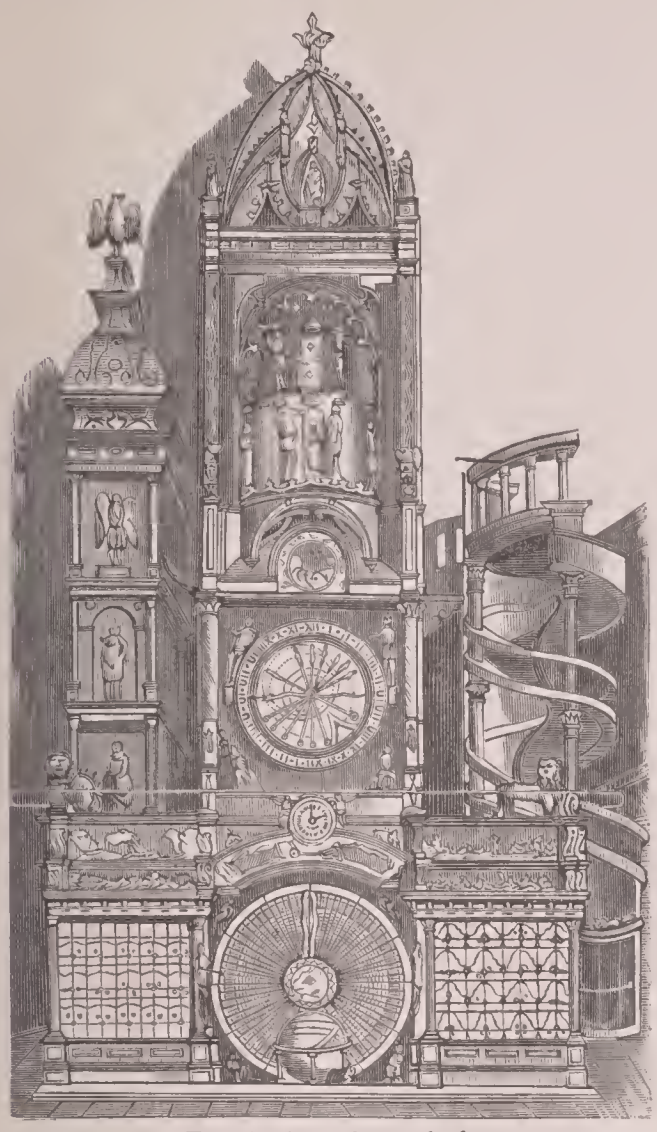


Fig. 4.—Strassburg clock.

electric or magnetic clock belongs properly to the departments of astronomy and telegraphy. See Electric Clocks, Escapements, Pendulum, and Strassburg.

Clo'dius [simply another form of the more common *Claudius*], Publius, surnamed Pulcher (i. e. handsome): a profligate Roman tribune and patrician; was a brother of Appius Claudius Pulcher, and is well known from Cicero's *Oratio pro Milone*, which, however, is in the highest degree exaggerated and false. Clodius served in Asia, in his youth, under his brother-in-law Lucullus, and in 62 B. C. committed sacrilege by intruding himself, disguised as a woman, into the mysteries of Bona Dea. At his trial for this offense he attempted to prove that he was not in Rome at that time, but Cicero testified that he saw Clodius in Rome on that day, and thus incurred his enmity. Clodius was acquitted by means of bribery, and was elected tribune of the people in 59 B. C. He persecuted Cicero by the enactment of a law that he should be interdicted from fire and water, and drove him into exile. Clodius was killed in 52 B. C. in an encounter with Milo, who was a partisan of Cicero and was the political enemy of Clodius, whom he succeeded as tribune.

Cloister [from O. Fr. *cloistre*: Ital. *chiostro* < Lat. *claustrum*, *clostrum*, bar, inclosed place]: an inclosed court or yard surrounded by covered walks, built for the use of clergymen and their assistants in a cathedral, or monks or nuns in a monastery. The open space surrounded by the covered walks is called the cloister-garth, and the walks themselves are the ambulatories or simply *the cloisters*. In a few cases these walks are built in two stories. They are always more or less open on the side toward the garth, and they are often very richly adorned with elaborately designed arcades and with statues and other sculpture. In some instances fountains or cisterns of running water are added.

Clonmel' (i. e. Vale of Honey, from the Gaelic): a municipal borough of Ireland; built on both sides of the river Suir: 14 miles S. S. E. of Cashel (see map of Ireland, ref. 12–F). It lies mostly in the county of Tipperary, and partly in that of Waterford. It has an endowed school dating from the year 1685, two lunatic asylums, and a church of the twelfth century. There is a trade in agricultural produce, cattle, and butter. In 1650 the town was taken by Cromwell and its fortifications dismantled. Pop. (1891) 8,480.

Clonmel, Earls of (1793): Viscounts Clonmel (1789), and Barons Earlsfort (Ireland, 1784).—John Henry Reginald Scott, fifth earl, born Mar. 2, 1839, succeeded his father, John Henry Scott, in Feb., 1866. D. in 1891. Succeeded by Thomas Charles Scott, b. in 1840.

Clontarf': a town and bathing-place of Ireland; on Dublin Bay, 3 miles E. N. E. of Dublin (see map of Ireland, ref. 9–J). Here in 1014 Brian Boru gained a great victory over the Danes. Near this town is Clontarf Castle, the residence of the Vernon family. Pop. (1891) 5,104.

Clootz, Jean Baptiste, Baron du Val de Grâce: a visionary character of the French Revolution; b. near Cleves, Prussia, June 24, 1755. Taking the name of Anacharsis, from the celebrated philosophical romance of Abbé Barthélemy, he traversed Europe, proclaiming the brotherhood of the human race. He contributed large sums to the French republican cause, to which he looked for the fulfillment of his hopes of universal freedom. He was excluded from the Jacobin Club at the instigation of Robespierre, and guillotined for a fictitious offense Mar. 23, 1794. See his *Life* by Avenal (Paris, 1865).

Closure: See Cloture.

Clot: See Blood and Coagulation.

Clothaire I.: b. in 497 A. D.; fourth son of Clovis, King of the Franks. He became King of Soissons in 511, when the dominions of Clovis were divided among his sons. By murdering two of his nephews he obtained the sovereignty of Austrasia and Orleans, and reigned at Paris over all the former dominions of Clovis. D. in 561 A. D., leaving four sons—Caribert, Gontran, Sigebert, and Chilperic I., who divided the realm between them.

Clothaire II.: son of Chilperic I.; was a minor when he inherited the kingdom of Soissons in 584 A. D. His mother Frédégonde was regent until 597. He put to death Brunehaut, Queen of Austrasia, and usurped the throne of that country in 613 A. D. He thus became sovereign of all France. D. in 628 A. D. He was one of the Merovingian dynasty.

Clothes-moth: See Moth.

Clo'tho: in classic mythology, one of the Fates (*q. v.*).

Clotho: an asteroid discovered by Tempel in 1868.

Clotho (a serpent): See Puff-adder.

Clotil'da, Saint: Queen of France; daughter of Chilperic, King of Burgundy. She was married in 493 A. D. to Clovis I., whom she induced to profess the Christian religion in 496. She opposed Arianism. D. in Tours in 545 A. D., and was canonized soon after.

Cloture, or **Closure**: a proceeding in the British House of Commons for closing debate and bringing on an immediate vote on the question under consideration. It is a term of French origin, and the rule of proceeding grew out of obstructions to business made by the Irish members of Parliament as an avowed policy. In 1882 the Speaker was authorized, when he was of the opinion that the House desired to come to a vote, to so inform the members, when a motion could be entertained thereupon to close the debate. In 1887 it was further provided that a member may claim to move "that the question be now put." Unless the chair holds this motion to be an infringement of the rules or an injustice to the minority, he proceeds to take the vote on the closure, and if not less than a hundred members sustain it the closure is determined in the affirmative. Like results are obtained in the popular branch of legislative bodies in the U. S. by moving the previous question (*q. v.*), but in Parliament the previous question has another purpose. See Law-making.

Cloudburst: an extremely heavy rain occurring over a small territory. Such rains occur only with local, not general, storms; are most common in the hottest season and at the hottest time of day; and occur most frequently in the arid regions or on mountain-sides. The rain sometimes falls at the rate of 4 or 6 (and possibly more) inches per hour, but it continues only a few moments. Meantime the phenomena of atmospheric electricity are usually very marked. The flood of water that descends flows off rapidly, coming down the streams with a head of water which is often very destructive. A distinction is usually drawn

between cloudbursts and torrential rains. The latter belong to general storms, the former to local ones, the remarkable cloud formations and sudden clearing afterward making the name very appropriate for the former and not at all for the latter. MARK W. HARRINGTON.

Clouds: collections of extremely minute particles of water suspended in the atmosphere. These particles are often ice crystals, in consequence of the elevation at which they float. Aitken's researches have shown that the nuclei of clouds and fogs probably consist of minute dust particles. While fog is principally formed by the cooling of the lower layers of the atmosphere, clouds owe their existence more especially to the rising currents which, when cooled to the dew-point, condense into cloud. The lower limit of the cloud region is therefore determined by the height at which the rising currents reach their dew-point, and the altitude of the cloud formation depends upon the humidity of the ascending currents; the drier it is, so much the higher must it rise to have its vapor condensed. The cloud masses, being heavier than the air, tend to sink, but the sinking takes place very slowly, partly because the water particles and the ice needles which compose the clouds are very small, and partly because the rising currents to which they owe their origin counteract the sinking process. Sometimes the rise and fall of the cloud is only apparent, being due to the condensation or vaporization of its particles. Frequently the rising current mingles with a horizontal current, which carries with it the upper portion of the cloud and covers the sky with a uniform stratum. The summits of mountains are often enveloped in clouds because they favor the ascent of air up their sides, and cause the condensation of the contained vapor. The wind drives these clouds over the summit, but when the air currents descend on the other side the vapor particles are again dissolved. A classification of clouds, according to strict scientific principles, has not yet been made. Existing classifications depend rather upon the form of the clouds than upon their origin. The classification most generally used is that originated by Howard in 1803. Another system, due to Abercromby and Hildebrandsson, was recommended for general use by the International Meteorological Congress at Munich in 1891. In all systems the chief forms are the cirrus, cumulus, and stratus, which, in the nomenclature last mentioned, have been subdivided into subordinate types, which may be defined as follows. The average heights and velocities of the different classes of clouds for the year, obtained from measurements by Clayton at the Blue Hill Observatory, are also given.

Cirrus are thin, fibrous, detached, feather-like clouds formed of ice crystals. They are the highest clouds, averaging over 29,000 feet, and move with the greatest velocity, their mean being 89 miles per hour.

Cirro-stratus form a thin white veil, more or less fibrous, which produces halos and other optical phenomena. This cloud has an average height of 27,000 feet, and an average velocity of 70 miles per hour.

Cirro-cumulus are flocks of small, detached, fleecy clouds, at an average height of 23,000 feet, and have an average velocity of 82 miles per hour.

Alto-stratus is a gray-blue veil, through which the sun and moon are faintly visible. Its mean height is about 15,400 feet, and its mean velocity 48 miles per hour.

Alto-cumulus consists of large, more or less rounded balls, flat rolls or disks of fleecy clouds in flocks, white in color, except a dark shading here and there. They average 10,000 feet in height, and move with an average speed of 34 miles per hour.

Strato-cumulus are large balls or rolls of dark clouds; average height, 6,200 feet; average velocity, 22 miles.

Cumulus are piled up clouds with conical or hemispherical tops and flat bases. They are formed of rising currents of heated air, and are therefore most common in summer and in tropical regions. Their average height is 4,700 feet, and average velocity 26 miles per hour.

Cumulo-nimbus is a massive cloud from which showers fall. Its mean height is 4,500 feet, and its average movement is 33 miles per hour.

Nimbus is a dark sheet of ragged cloud from which rain or snow usually falls. Its height averages only 2,900 feet.

Stratus is either elevated fog floating in the air or a thin uniform layer of cloud at a very low level (1,800 feet), which moves only 16 miles per hour. These heights agree with those found in Europe, but the velocities of the highest clouds measured at Blue Hill are nearly double those found in Europe.

Cloud-forms have been shown to be identical in all parts of the world, but their seasonal and diurnal distribution as regards both kind and amount varies. As weather prognostics, clouds have long been studied, but it is only recently that this has been systematically done by means of synoptic charts covering a large extent of country.

A. LAWRENCE ROTCH.

Clouet, kloo'ay', **Cloët**, FRANÇOIS: portrait-painter: descended from a family of Flemish artists: his father, JEAN (1485–1545), a court painter, was the first of the family born in France, and figures in the royal accounts as Jehannot or Jehannet Clouet, a name soon abbreviated to Janet, under which form François was popularly known. The son was born in Tours about 1510: became a court painter and a *valet de chambre* to the king on the death of his father. He was an emulator rather than an imitator of Holbein, and has left many portraits of distinguished people of the highest interest from their remarkable fidelity and technical excellence. Among these are *Henri II.*, *Charles IX.*, and *Elizabeth of Austria*, in the Louvre: the child *Francis II.*, at Hampton Court, and a notable *Dauphin Francis II. and Marie Stuart*. D. about 1580. W. J. STILLMAN.

Clough, klŭf, ANNE JEMIMA: educator; b. in Liverpool about 1822: sister of the poet Arthur Hugh Clough: lived in Charleston, S. C., from the age of three until sixteen; returning to England, became interested in national schools; began private day-school in 1842; became strongly interested in the idea of combined education; wrote on the subject in *Macmillan's Magazine* 1864; through her efforts in Liverpool and Manchester founded the North of England Council for Promoting the Higher Education of Women, from which came the idea of the Cambridge higher local examinations, first instituted for women only and afterward opened to men. Lectures for women were established at Cambridge 1869; Oct., 1871, Miss Clough took charge of a house of five women students at Cambridge; this number rapidly increased and Newnham Hall was built (1875), a second building, larger than the first, 1880, and a third handsome hall in 1888, and over the administration of these Miss Clough presided. Her powers of organization, tact, and sympathy contributed to her success as a leader in the movement for the higher education of women in England. D. Feb. 27, 1892. See NEWNHAM COLLEGE.

Clough, ARTHUR HUGH: poet; b. in Liverpool, England, Jan. 1, 1819; lived five years in Charleston, S. C.; educated at Rugby and at Balliol College, Oxford, where he took his bachelor's degree in 1841. From Balliol he was elected to a fellowship at Oriel, and he remained at Oxford until 1848, in which year appeared his first published poem, *The Bothie of Tober-na-Vuolich: a Long-Vacation Pastoral*. The poem is written in English hexameters, and recounts the adventures of a party of Oxford reading men in the Scotch highlands. Clough was deeply stirred by the High Church revival in Oriel, of which Newman was a leading spirit; was driven by the honesty of his mind to examine the basis of religious belief, and after a painful struggle felt compelled to withdraw from Oxford in 1848. He spent a year or two in travel on the Continent, going as far as the Italian lakes. On his return he published in 1849 a series of poems, of which the earliest date back to 1840, under the title of *Ambarvalia*.

He now passed from one employment to another: was warden of University Hall, London; visited America, and resided at Cambridge, Mass., for a few months in 1852, returning to England to accept an appointment in the education department of the Privy Council office. Clough was a man of strong religious feeling, but unfixed beliefs. In his *Poems on Life and Duty* and the subtle dialogue poem of *Dipsychus* he gives expression to this hesitation between doubt and faith. His other longer poems are *Amours de Voyage* and *Mari Magno*, a series of metrical tales. D. in Florence, Nov. 13, 1861. Matthew Arnold's fine elegy *Thyrsis* celebrates his "contention-tost" friend. See Clough's *Poems* (1862), with a memoir added by F. T. Palgrave, and his *Poems and Remains* (2 vols., 1869), edited by his wife.

H. A. BEERS.

Clove-bark: See CULILAWAN BARK.

Clover, or **Trefoil** [*clover* is from O. E. *clabre*, *clafre*: Low Germ. *klāver*: Fries. *klafer*; these represent a deriv. or comp. of the word appearing in High Germ.; cf. Mod. Germ. *Klee*. Not connected with Eng. *cleave*]: a name properly applied to plants of the genus *Trifolium*, family *Leguminosæ*, comprising about sixty indigenous species in

the U. S. and many in the Old World. The word is also used for other related plants which have three leaflets, as *Melilotus*, the sweet clover; *Medicago*, the bur clover; *Lespedeza striata*, the Japan clover; *Petalostemon*, the prairie clover, etc. The true clovers are invaluable agents in agriculture, not only because they make good hay and afford excellent pasturage, but chiefly because of their power of appropriating atmospheric nitrogen by means of their roots. Clovers have long been recognized as productive of great value to land, but the full meaning of this benefit has not been understood until within the last one or two decades. They are invaluable in the rotation, because, in addition to their power of nitrogen-gathering, they develop a deep and strong root-system, thereby bringing up fertilizing materials from the deeper parts of the soil and leaving them in available form near the surface, and also filling the earth with vegetable fiber which aids greatly in aërating and warming the soils, and therefore indirectly increasing its fertility. Clovers ordinarily require little fertilizing to bring them to profitable conditions, particularly little of nitrogen. In hard lands they are a most efficient means of loosening and pulverizing the soil when plowed under, and they add greatly to the power of light and leachy soils to hold fertility and moisture.

There are five chief species of clover in cultivation. The most important one is the common or red clover (*Trifolium pratense*). Others are the mammoth clover (*T. medium*); the crimson, scarlet, or carnation clover (*T. incarnatum*); the alsike clover (*T. hybridum*); and the common white or creeping clover or shamrock (*T. repens*). These are all natives of the Old World, although the last is supposed to be also native to the U. S. They are all perennials, except the crimson clover, which is an annual; but they usually begin to fail in vigor after they have occupied the land two or three years. The alsike persists the longest of those mentioned, and is best adapted to moist grounds. The white clover is generally sown only upon lawns, although it forms a very excellent "bottom" for mowing and pasture lands. The crimson clover has come into great prominence in the U. S. within recent years as a cover or catch crop for orchards, being sown when the regular cultivation of the orchard land is stopped, late in summer, and being plowed under early in the spring. It thus occupies the land at a time when the trees are not making great demands upon the soil, and it holds the rains and snows of winter and prevents the soil from puddling. When turned under, it affords much available plant food. Red clover is distinguished from the mammoth clover by a whitish spot on the leaves, and by having the head closely subtended by involucral leaves. In the U. S. the red clover is more used than the mammoth. The average feeding value of the green fodder is as follows: water, 70·8 per cent.; ash, 2·1; protein, 4·4; fiber, 8·1; nitrogen free extract, 13·5; fat, 1·1. The fertilizing value of the green fodder is as follows: moisture, 80 per cent.; nitrogen, 0·53; phosphoric acid, 0·13; potassium oxide, 0·46. The fertilizing analyses of the dry hay show: moisture, 11·33 per cent.; ash, 6·93; nitrogen, 2·07; phosphoric acid, 0·38; potassium oxide, 2·20. Mammoth clover is very like the common red clover, but attains to a larger size, and ripens a week or two later.

On account of its heavy growth it is more difficult to cure well than the common clover when made into hay, but its manurial value is thereby the greater when it is plowed under. In some tests it has given a greater yield of cured hay than the other, but in other tests the yields of the dry product have been practically alike. See the Reports and Bulletins of the different agricultural experiment stations, and *Clover Culture*, by Henry Wallace. L. H. Bailey.

Cloves [via Fr. from Lat. *clavus*, nail; so called from its resemblance to a nail]: the unexpanded flowers of *Eugenia aromatica* and family *Myrtaceæ*. They are officinal in the U. S. Pharmacopœia under the name of *Caryophyllus*. Unlike some of the other drugs possessing volatile oils, they do not appear to have been known to the ancients, although they were very early introduced into Europe by the Arabs.

They are derived from a handsome evergreen tree, which is supposed to have existed originally in only five small islands near the island of Jilolo, and which therefore obtained the name of the Molucca or Clove islands. No clove-trees are now to be found on these islands, but they are largely cultivated in Brazil, in many islands of the Indian Ocean, in tropical Africa, and in some of the West Indies. The height of the tree varies from 30 to 40 feet; it is well branched, the branches forming a handsome clustering crown. As soon as the buds change in color from green to red they are taken from the trees either by a process of beating or by picking, and spread upon cloths, after which they are dried by exposure to the sun and air, when they become brown in appearance. Ordinary unbroken cloves resemble very closely a small round-headed tack, and emit a peculiar oily aromatic odor. The taste is also spicy and pungent. The color is a deep brown, but on section the interior portion may be somewhat reddish. In addition to the volatile oil, cloves contain a resin or gum and a peculiar tannin. From cloves have also been isolated two substances, one known as caryophillin and caryophillic acid.

The oil of cloves, when freshly distilled, is quite fluid, clear, and devoid of color, and becomes yellowish and finally reddish brown on exposure. Its specific gravity varies from 1·034 to 1·061. It is soluble in an equal volume of alcohol and in ether and strong acetic acid. It is used as a flavoring substance, as a carminative, and sometimes as a local anæsthetic, particularly in cavities of carious teeth. H. A. H.

Clo'vis I., called also **Chlodwig**: King of the Franks; b. in 465 A. D. He was the son and successor of Childeric, who reigned at Tournay and died in 481. By a victory over the degenerate Romans and Gauls, commanded by the patrician Syagrius in 486 A. D., Clovis obtained possession of Soissons, which then became his capital, and here Remigius, Bishop of Rheims, became his counselor and friend. Under this influence he married in 493 Clotilda (*q. v.*), a Christian princess, and about three years later was converted to the new faith and baptized. The story of his conversion connects it with the battle of Tolbiac (Zülpich), near Cologne, at which, being hard pressed by the Alemanni, he appealed to the God of Clotilda, his wife, promising that if victory were granted to his army, both himself and his Franks would worship the Christian God. The Alemanni were routed, and Clovis kept his vows. He and a large number of his soldiers were baptized by Remigius, Bishop of Rheims, Christmas, 496. His conversion contributed to bring the Teutonic races generally into closer communication with the Christian Church and Roman civilization. In 507 he defeated Alaric, King of the Visigoths, in a great battle near Poitiers. By this victory he added Aquitaine to his dominions. He chose Paris as his capital in 507, and here he died, Nov. 27, 511 A. D. France was then divided among his four sons—Thierri, Clodomir, Childeric, and Clothaire. His descendants are called Merovingians, from Merovig, the grandfather of Clovis. With him the Salic Law entered France, and the alliance of the Church and state. With him, too, the distinctive history of France begins. See Barthold Zeller, *Les Francs mérovingiens, Clovis et ses fils* (1880).

Clowet, Clouet, or Clovet, Pieter: a Belgian engraver; b. in Antwerp in 1606; d. in his native city in 1677; and Albert, his nephew; b. in Antwerp in 1624; also an engraver; d. in the city of his birth in 1687. They reproduced works by Rubens, Van Dyke, Bourguinon, and Cortone.

Clown [M. Eng. *cloune, cloyne*; origin obscure]: a professional jester or buffoon. The character may have had its origin in the ancient Roman Pantomime (*q. v.*), which passed into the representations of the wandering acrobats of the Dark Ages, and thence into the Mysteries (*q. v.*) and miracle-plays, and later was developed into the Harlequin (*q. v.*) by the Italians. The clown or court-fool, who forms no inconsiderable a part of Shakspearean characters, just at the time when the private employment of buffoons was going out of vogue, was a part of the household of mediæval princes and great barons. The last of them was Archie Armstrong, who was attached to the court of James I. and Charles I. in Great Britain; suffered at the hands of Laud, and died in 1672. Triboulet, the court-fool of Francis I., was made immortal by Rabelais, and a number of others have become historical. The court and pantomime fools wore a characteristic dress, motley coat and tight breeches, and carrying a bauble or short staff with a ludicrous head. Sometimes asses' ears were added and a cock's comb. The clowns of Shakspeare are supposed to have been drawn from the "vice" in the mysteries, which the Italians again developed into the zany, a foil to the more serious and capable clown. It was the business of the zany to follow and caricature the clown. He was a merry-andrew, full of incompetencies, and bringing all the tricks of the clown into ridicule by absurd imitations of them, generally ending in failure. Where there was only a single clown he performed both functions, and in this shape he becomes the jester of

the modern circus. Court-fools were known to the Baghdad caliphs, and Bahalul, the jester of Harun al-Raschid, is a character in Arabian literature. See Doran, *History of Court Fools* (1858).

Club-foot, technically known as **Talipes**: a deformity, mostly congenital, which usually affects both feet. In the most common form the inner margin of the foot is elevated, the external one depressed, touching the ground; the middle and anterior portions are retarded in their growth, and the joints become immovable. This condition becomes more prominent when the child begins to walk, sometimes to such an extent that the upper part of the foot takes the place of the sole. Simultaneously the muscles of the leg become emaciated, and lose their characteristic texture. The cause has been sought for in diseases of the brain or spinal cord, contracted before birth; some are supposed to be due to a continued pressure in the womb; and a rational explanation for many cases is offered by considering the early condition of the fœtus. The lower extremities are formed at about the first month of pregnancy on the anterior aspect of the abdomen of the fœtus, under the skin, with the knee-pits facing the body; consequently to assume its normal position a rotation of the extremity around its axis, including the foot, is necessary. When this process, as far as the foot is concerned, remains incomplete, club-foot is the result. Some cases are the result of an abnormal obliquity of the small bones of the tarsus or posterior portion of the foot, and a primary shortness of the gastrocnemius muscle of the leg. Club-foot acquired after birth is due to muscular paralysis, bone disease, or traumatism. In paralysis one group of muscles permits the unrestricted action of the opposing group, which eventually results in a deformity of the foot. In mild cases manual stretching of the foot, proper bandaging, and the application of a plaster dressing will suffice. More marked cases require the cutting of one or more tendons and subsequent use of appropriate apparatus. In the acquired forms, especially cases due to traumatism, where the use of apparatus often is attended with pain, complicated operations are frequently necessary.

A. Jacobi and F. E. Sondern.

Club-mosses, or **Ground-pines**: small plants with a moss-like aspect belonging to the families *Lycopodiaceæ* (club-mosses and ground-pines) and the *Selaginellaceæ* (little club-mosses). These families, with the modern family *Isoetaceæ*, and several which are extinct (*Lepidodendreæ* and *Sigillarieæ*), constitute a well-marked class of the "fernworts" (*Pteridophyta*) under the name of *Lycopodinæ*, commonly called the Lycopods (*q. v.*). See Lycopodium.

Charles E. Bessey.

Clubs: societies of persons united for social, scientific, artistic, literary, or political ends, or for purposes of recreation. The etymology of club in this sense is obscure. It may be derived from the Saxon *cleofian*, to cleave, in allusion to the division of the reckoning of the guests of an ale-house; but in its present signification it is perhaps closely allied to *cleave*, to adhere. It is also said to be derived from the Swedish *klubb*, as meaning a clump, or tightly packed body of men; Carlyle, in his *History of Frederick the Great*, assumes that the vow of the chivalric orders ("Gelübde"), in vogue A. D. 1190, passes to us in the singularly dwindled condition of the modern word club. The Friday Street, or more correctly Bread Street, Club, in London, was long regarded as the first in England, but in the reign of Henry IV. there was a club called "La Court de bone Compagnie," of which the poet Occleve and probably Chaucer were members. About the beginning of the seventeenth century or the end of the sixteenth the famous club at the Mermaid Tavern in Bread Street was established. It had Shakspeare, Beaumont, Fletcher, Raleigh, Donne, Selden, etc., as members. About the same time Ben Jonson founded a club which met at the Devil Tavern, between Temple Bar and Middle Temple Gate. In 1659 the first political club, the Rota, was established, meeting at the Turk's Head in New Palace Yard. In 1669, three years after the great fire, the Civil Club, which exists to this day, was established in the city, all the members of which are citizens. Some of these early political clubs played important parts in the history of the times. Such was the October Club, named after the cheer for which it was famed, October ale, the members of which were ardent Tories. Swift was a leading spirit of the October, and frequently alluded to it in the *Journal to Stella*. The Saturday, Brothers, and Scriblerus Clubs, each having Swift as a member, and the Calves'-head Club, formed in ridicule of the memory of Charles I., the King's-head Club, founded by the unscrupulous Shaftesbury, and the Mug-house Club, so called from the ale-mugs used by the members, were among the more noted political clubs of the early part of the eighteenth century. Another unique club, the Kit-Kat, famous in literature, dates from the year 1700. Its curious name is said to be derived from a noted mutton-pie man, Christopher Katt, whose Christian name was shortened to Kit. Among the members were the Dukes of Marlborough and Devonshire, Lord Halifax, Sir Robert Walpole, Congreve, Granville, and Addison. The club had each of its toasting-glasses inscribed with a verse to some reigning beauty. Contemporaneous in origin with the Kit-Kat were the Tattlers Club in Shire Lane, and the famous Beefsteak Society, bearing as its badge a gridiron with the motto "Beef and liberty." Among the "Steaks," as the members were called, were Garrick and Hogarth.

Readers of Boswell are familiar with the Ivy Lane Club established by Dr. Johnson at the King's Head, a beefsteak-house in Ivy Lane, and the Literary Club, founded by Johnson and Sir Joshua Reynolds in 1764, which had among its members Boswell, Goldsmith, Burke, and others famous in literature.

The purely social club of the present day owes its origin to the famous coffee-houses of the eighteenth century, where congenial spirits used to meet for social intercourse and comradeship. In time the proprietor of the coffee-house was persuaded to exclude all but a chosen few from his doors, and none were to be admitted except those balloted for by the members. These coffee-house clubs were in most cases known by the names of the original proprietors, and many of them have remained in existence to the present day. Among these proprietary clubs may be mentioned Almack's (1764), Brooks's (1778), White's, originally established as White's Chocolate-house in 1698, and afterward removed in 1755 to its present site in St. James's Street, and Boodle's, the resort of country squires and hunting-men.

Of these White's and Brooks's were in the early days famous gaming-establishments, frequented by the young men of fashion, where such erratic geniuses as Fox and Sheridan gambled away their fortunes, and thousands of pounds changed hands in a single night. White's has retained its aristocratic exclusiveness to the present day, and is still among the most prominent of London clubs. About the close of the Napoleonic wars the modern-club era began with the organization of the Travellers' Club in 1814 by the Marquis of Londonderry, which is to-day one of the most exclusive of English clubs.

The period from 1815 to 1855 saw the establishment of the palatial modern clubs lining Pall Mall and Piccadilly, which form so important a part of English social life. Among these may be mentioned the Athenæum (1824), the resort of authors, artists, and patrons of the sciences and arts; the Garrick (1831), the home of patrons and professors of the drama; the Oxford and Cambridge (1835), for members of the two universities; the Carlton (1831), Conservatives (1845), and Reform (1830), composed of prominent members of the two great political parties; the United Service (1815), the Army and Navy (1851), the Guards' Club (1850), and the Junior United Service, in all of which the membership is confined to naval and military officers in her Majesty's service; the Marlborough, fostered by H. R. H. the Prince of Wales; and the Bachelors' and Wellington, where gentlewomen are admitted with certain restrictions. There are in addition to the famous political, literary, and social clubs, institutions devoted principally to athletic sports, such as the Marylebone Cricket Club; Thames and Leander rowing clubs; and the Hurlingham and Ranelagh country clubs, where polo and pigeon-shooting are the attractions. The word club, however, is not confined to the select social organizations owning their own buildings which line the prominent streets of great cities, but the organization of societies of men or women banded together for some specific interest or pursuit, and bearing the name "club," has become so general that clubs of some form are now found in every city in the civilized world. From England the designation "political clubs" was adopted by similar organizations on the Continent during the eighteenth century, where they played an important *rôle* in contemporaneous political history. In 1793 they were prohibited in Germany. In France they became the hotbed of the Revolution. The first French society that took the name club was the Club Politique, established at Paris in 1782, and shortly after, in 1785, a second was organized under the name of the Club de Boston, or

"des Américains"; and soon the appellation was adopted by the notorious Clubs des Jacobins, des Feuillants de Montrouge, des Cordeliers, etc. Purely social clubs have also been established on the Continent, but unfortunately they have in many cases become little better than gaming-houses. Of the most famous modern Parisian clubs the Jockey Club and the Cercle Royale deserve mention, for their exclusiveness and importance in the social life of the French metropolis.

In the U. S. club-life owes its origin to the Union Club, founded in New York, June 17, 1836. The Somerset Club of Boston, founded in 1857, the Maryland Club of Baltimore, 1857, and the Chicago Club of Chicago, established in 1869, indicate the rapid growth of club-life in the U. S. Among famous New York clubs may be mentioned the University (1865); Union League (1863); Authors', founded by Noah Brooks, R. W. Gilder, Edward Eggleston, Brander Matthews, and others; and the Players', counting Edwin Booth, Thomas Jefferson, and S.L. Clemens (Mark Twain) among its founders. Club-life is not confined to the wealthy, for workingmen's clubs have been successfully operated on both sides of the Atlantic. These institutions, modeled after the social clubs of the rich, are established by and in the interests of workingmen, and have proved very efficient in improving the social condition of the laboring classes. In many of them the sale of intoxicating liquors is prohibited, and the necessaries of life are supplied to members at cost prices.

H. C. Chatfield-Taylor.

Clubs for Women: the growth in the U. S. of clubs for women is one of the marvels of a century prolific in new movements. In Mar., 1868, the first club exclusively for women, Sorosis, was founded, in an experimental way, in New York city, "for the promotion of agreeable and useful relations among women of literary, artistic, and scientific tastes, and for the discussion and dissemination of principles and facts which promise to exert a salutary influence on women and on society." Its formation was due to the refusal of the committee on the Dickens dinner, from the Press Club, to allow women to participate equally with men on that occasion. Twelve ladies, including Mrs. J. C. Croly, the founder, organized Sorosis, whose name is a botanical term derived from a Greek word signifying a heap or collection. Its first president was Sarah (Willis) Parton, popularly known as "Fanny Fern." The interest in such associations has grown until it is estimated that there are in the U. S. 500 clubs with an aggregate membership of not less than 50,000.

To estimate properly this advance it must be remembered that prior to 1868 there were no associated movements among women outside the church, the suffrage, and the anti-slavery cause, and these were combined with, if they were not controlled by, men. Puritan influence aided the custom, and traditions of the ages were potent in limiting women to a subordinate place, and keeping them "silent," in and out of the churches. It is worth noting that the new movement was not in the nature of a revolt, but was more like an awakening. The central idea carried with it nothing belligerent, nothing antagonistic, nothing in a nature of a demand or an assertion. The cardinal principles were unity, fellowship of one woman with another on a platform of professed ignorance, and sincere desire to learn. The movement brought together women of all creeds and no creed, women of diverse social position and environment, women of widely differing opportunities and degrees of culture, and made of them an harmonious body, enriched by the contribution of each to the whole.

This club idea of kinship and unity on the basis of womanhood alone is distinctly modern, at least so far as any practical exemplification of it is concerned, and its inculcation has created a new social departure, and an active, many-sided social life before almost unknown.

What may be called the second period in the life of women's clubs, and their growth into a movement, began in 1889. At the suggestion of Mrs. Croly, a call for a convention of clubs was issued by Sorosis, which proposed to celebrate its twenty-first birthday by such a gathering.

Of 96 clubs addressed, 65 responded by sending delegates. The convention held its sessions Mar. 18–20, and a committee representing the New York Sorosis, the Woman's Club of Brooklyn, and the New Century Club of Philadelphia drafted a constitution and devised a plan of permanent organization to be submitted in the following year. The desirability of giving voice to and recording the history of this rapidly growing movement suggested the idea of a journal devoted to literary and club interests, and a periodical with this avowed object was begun in the autumn of 1889, under the name of *The Woman's Cycle*. Among its features were a directory of clubs and a record of club-work. The first convention of the "general federation" met by invitation of Sorosis at Scottish Rite Hall in New York, on Apr. 23–25, 1890, and was presided over by Mrs. Ella Dietz Clymer, then president of Sorosis. Sixty clubs, representing eighteen different States, participated in this ratification convention, and established the general federation of women's clubs upon a permanent basis, and elected Mrs. Charlotte Emerson Brown, of East Orange, N. J., president.

In the two years between the organization convention at Scottish Rite Hall in 1890 and the first biennial convention at Chicago in 1892 the federation gained an aggregate membership of upward of 200 clubs, representing a membership ranging from 15 to 500, and some with outgrowths of many hundreds more. These clubs covered 31 States, and to the list must be added India, with two federated women's clubs; one in Bombay, founded by a New York physician, Dr. Emma Brainerd Ryder, and one in Ceylon, also the result of Dr. Ryder's efforts. The first mentioned, which numbers more than 250 women, and includes Europeans and natives belonging to six different castes, is the first instance of a general overcoming of the caste spirit.

This rapid growth was accelerated by the federation system of organization. Under this method the president of a federated club became a vice-president of the federation. A federation correspondent from each State was also appointed, whose duty it was, and is, to act as the medium of communication between the individual clubs of her State or territorial area and the central board.

The motto of the general federation is "Unity in diversity." Naturally there are great diversities in clubs in different neighborhoods and different parts of the country, but they are usually differences of detail, not of basis or essential principle. A curious and predominant element in the woman's club idea is its flexibility and ability to lend itself to the needs of its locality and the growth of the membership. It would be easy to enumerate such important achievements as the building of club-houses and institutes, such as the Athenæum of Milwaukee, the Propyleum of Indianapolis, the New Century Club-house of Philadelphia, the club-house at Grand Rapids, and others; but the best result of the work of women's clubs has been seen in the new life of the small towns, the movement in the stagnant waters of quiet village neighborhoods, the uplifting influence of the higher thought, and the democratic spirit that has been fostered. In general terms it may truthfully be said to have changed the tone of whole communities. In particular, it has taught women how to think, how to speak, how to act for the best good of the community in which they live. It has made them acquainted with the best work, the best ideas, and the great thinkers of their own and all times. It has taught them values and proportion and the historic continuity of events, thus forming a basis for a new conception of the philosophy of life and duty, and destroying prejudice. Some clubs have done much in philanthropic directions, particularly in the farther West, where organizations for the benefit of women and children and neighborhood improvement hardly existed until the woman's club created it. Among the outgrowths are, protective and educational unions, provident funds, study-classes, reading-rooms for the benefit of workingwomen, as well as social centers.

London has several clubs for women, but they are not as broad in their aims as those of the U. S. The New Somerville Club, which is chiefly intended for professional women, devotes its Tuesday evenings to discussions and lectures, the subjects being treated in a general and non-partisan way. The Denison Club has for its object "the promotion of friendly intercourse and open discussion between men and women interested in social and industrial questions, and the encouragement of study and investigation." One or more meetings are held monthly, at which papers on practical subjects are read and are followed by a conversation. The University Club for Ladies admits only those who have or have had, as students or lecturers, connection with some college affiliated with a university, or who are registered medical practitioners of the United Kingdom. The Alexandra is a proprietary club of a fashionable and exclusive character. The Pioneer is composed wholly of women, and follows American ideas.

One of the strongest fears expressed in regard to women's clubs in the beginning was the fear that they would tend still more to the separation of sexes. This result has not followed. On the contrary, club-life is bringing men and women together, and the latest outcome of the woman's club is the mixed club of men and women, with higher standards than men's clubs have before known. But this would not have been possible had not women gained knowledge and experience in clubs of their own. J. C. CROLY.

Cluniacs, The, or **Congregation of Clugny** (*Cluniacum* in Burgundy, a very influential monastic institution): founded in 910 by Duke William of Aquitaine, who put his relative, Abbot Berno of Beaume, at the head of the new institution. As the aim of the duke was to effect a reform of monastic life, which had sunk very low in France, Berno enforced the strictest observance of the rules of St. Benedict; but just this severity struck a rich vein of sympathy in the time. Clugny became the reformer not only of the Benedictine order, but of monastic life in general, and its rules, *Consuetudines Cluniasenses*, were generally adopted. Three popes issued from its cells, Gregory VII., Urban II., and Paschalis II. Privileges and endowments were showered upon it, and it soon became one of the richest and most magnificent institutions of the Middle Ages. It received at one time Pope Innocent IV. and the King of France with their whole retinues in 1245. But lack of discipline and the dissipations of the abbots greatly impoverished the institution during the next two centuries. Under the Revolution the Constituent Assembly closed the convent, confiscated the property, and sold the buildings. The church was broken down. Some of its priceless literary treasures were saved, and are in the Paris Bibliothèque Nationale and the British Museum. The palace of the abbots in Paris became in 1833 a museum of antiquities.

AUTHORITIES.—Lorain, *L'Abbaye de Clugny* (Dijon, 1830); the works of Pignot, Cuchérat, and Champly; Duckett's *Record Evidence of Cluni* (1886); and *Charters and Records of Cluni* (1888).

Cluny, formerly **Clugni** (anc. *Cluniacum*): a town of France; department of Saône-et-Loire; on the Grône, here crossed by two stone bridges; 14 miles N. W. of Mâcon (see map of France, ref. 6–G). Here are the remains of a rich and famous Benedictine abbey, founded in 910 A. D. It has also the Church of Notre Dame of thirteenth century. Cluny has manufactures of gloves, lace, linen, paper, and pottery. Pop. (1896) 4,273.

Clupea: See ASPIS.

Clupeidæ [from Lat. *clupea*, a herring, the typical genus]: a family of fishes containing the herrings, shad, sprats, and closely allied species. Its members are characterized by having a compressed body, covered with easily detachable and usually rather large scales, sometimes forming a serrated ridge along the abdomen. The head is naked, mouth large and terminal. Maxillaries of three pieces; teeth, when present, small and numerous. Gill-openings large, gill rakers long and slender. There is no adipose dorsal fin; the anal is rather long; tail forked. The group contains about 130 species, found in all seas, although mostly near the coast; many species ascend fresh waters and some remain there. This group probably comprises more individuals than any other, as some species, like the common herring, assemble in immense schools and are taken in nets by tens of thousands. F. A. LUCAS.

Cluseret, klü'ze-ray', GUSTAVE PAUL: revolutionist; b. in Paris, France, June 13, 1823; aided to suppress the insurrections of 1848; served in Algeria and the Crimea, and reached the rank of captain; resigned in 1858 his place as captain in the French army because he had adopted the principles of Mazzini. In 1859 he commanded the contingent of French volunteers under Garibaldi, and in 1862 entered the volunteer army of the U. S., in which he became in 1862 a brigadier-general, serving on the staffs of Gens. McClelland and Fremont. In 1864 he published in New York the *New Nation*, to urge the nomination of Fremont for the presidency. His attempts, in 1870, to proclaim in Lyons and Marseilles the "Red Republic" failed. In Mar., 1871, the communists of Paris appointed him Chief of the War Department; on May 1 he was deposed, arrested, and impeached, but after a few days set free, and fled to England. After a short visit to the U. S. he settled at Geneva, Switzerland, in 1872.

Clusia [so called in honor of the botanist Lécluse or Clusius]: a genus of dicotyledonous trees and shrubs, many of which are epiphytic, belonging to the family *Guttiferæ*. About sixty species are known, all natives of tropical or sub-tropical America. They have opposite, coriaceous, entire leaves, and terminal, solitary or panicled, diœcious or polygamous, showy flowers. The sepals are from four to six, the petals from four to nine, the stamens numerous and indefinite, while the pistil is compound, with five to fifteen cells, with many ovules in each cell. On account of the yellow resinous juice which they contain some of them bear the name of balsam-trees, and in some cases this when dried into a resin is used for plasters, and for other medicinal purposes. One species, *C. flava*, is found in Southern Florida. It occurs also in the West Indies, and is known as the yellow balsam-tree on account of its medicinal yellow resin. *C. rosea* from the West Indies is grown in conservatories for its beautiful rose-colored flower. C. E. B.

Clustered Columns, or **Compound Piers**: piers which are composed or appear to be composed of several columns clustered together. They form one of the richest features of Gothic ecclesiastical architecture, in which they serve to support the pier-arches under the clerestory, and the vaulting of the side-aisles. The columns may have separate shafts grouped around a central core, or may be attached to each other and to the core throughout their whole length. In English Gothic they are frequently adorned with encircling bands or fillets at regular intervals. A. D. F. HAMLIN.

Clyde: the principal river on the west coast of Scotland; celebrated for the beauty of its scenery. It rises in the Lowther and Moffat Hills, and drains an area of about 1,500 sq. miles in the counties of Lanark, Renfrew, and Dumbarton. It flows at first N. as far as Biggar; it then takes a N. W. course, receiving the Douglas on the left at Harperfield. At Lanark, both above and below the town, are the Falls of Clyde, where the river descends about 350 feet in 4 miles. The highest fall is Corra Linn, in which there are three leaps aggregating 84 feet. The river then passes Hamilton, Glasgow, and Renfrew, and reaches the firth of Clyde at Dumbarton. Glasgow may be reached by the largest ocean steamers, and at Dumbarton the river is 1 mile wide. Total length, 73 miles. The valley of the Clyde is one of the most prosperous parts of Scotland.

Clyde: city; Clond co., Kan. (for location, see map of Kansas, ref. 4–G); on Mo. Pac., Ch., Rk. I. and Pac. and Union Pac. R. Rs., and on Republican river; has a trade in grain, hogs, etc. Pop. (1880) 956; (1890) 1,137; (1900) 1,157.

Clyde: village; Wayne co., N. Y. (for location of county, see map of New York, ref. 4–E); on the N. Y. C. and H. R. and the West Shore R. Rs., and on the Erie Canal and the Clyde river; 43 miles E. of Rochester. It has churches of five denominations, a large high school, 2 glass-factories, 6 malt-houses, canning-factory, 2 harness-factories, 2 grist-mills, tannery, steam-engine works, and a cooperage. Pop. (1880) 2,826; (1890) 2,638; (1900) 2,507. EDITOR OF "TIMES."

Clyde: village; Sandusky co., O. (for location of county, see map of Ohio, ref. 2–E); on the L. S. and M. S., the C. C. C. and St. L., and the W. and L. E. R. Rs.; 38 miles E. of Toledo and 75 miles W. of Cleveland. Here are eight churches, excellent schools, water-works (supplied by artesian wells), electric lights, piano-factory, edge-tool works, and other manufacturing industries. The village is situated in one of the richest agricultural regions of Ohio. Pop. (1880) 2,380; (1890) 2,327; (1900) 2,515. EDITOR OF "ENTERPRISE."

Clyde, LORD: See CAMPBELL, COLIN.

Clymer, GEORGE: statesman; b. in Philadelphia, Pa., in 1739; was brought up by his uncle, William Coleman, who made him his heir. Clymer resisted the sale of taxed tea in 1773, and subscribed liberally to the loans of the first Continental Congress. He was elected to the Continental Congress in 1776 in place of the Pennsylvania delegates, who refused to vote for independence, and signed the Declaration of Independence, although he was not present at its adoption. He was re-elected a member of Congress in 1780, and was a member of the convention which formed the Federal Constitution in 1787. He was the founder of the Pennsylvania Agricultural Society. D. in Morrisville, Bucks co., Pa., July 23, 1813.—His grandson, MEREDITH CLYMER, b. in Philadelphia, in June, 1817, became a distinguished physician in New York, where he was Professor of the Institutes of Medicine at the University of that city. He edited and wrote numerous treatises on nervous affections, fevers, and pulmonary disease.

Clysma: See EGYPT, ANCIENT.

Clytæmnes'tra, or **Clytemnestra** (in Gr. Κλυταιμνήστρα): the wife of Agamemnon, King of Mycenæ; was a sister of Castor and of Helen. She became the paramour of Ægisthus, and murdered Agamemnon and Cassandra on his return from Troy. She and Ægisthus were killed by her son Orestes. The legends concerning her were worked over by Homer, Euripides, and Sophocles.

Clyt'ia, or **Clyt'ie** (in Gr. Κλυτία, or Κλυτίη); the name of three mythical personages mentioned by Hesiod, Ovid, Pausanias, and Tzetzes. With Ovid (*Metamorphoses*, iv.) she is a nymph loved by Apollo, the god of the sun, but who, having offended and being forsaken by him, pined away with her eyes fixed on the sun, and was turned into a flower, which (from its ever turning toward the sun) was called *heliotropium* (ἡλιοτρόπιον).

Cnicin, nī'sin, or **Centan'rin**: the bitter principle of *Cnicus*, or *Centaurea benedictus*. It is in odorless, silky needles, having a pure bitter taste. See Blessed Thistle.

Cnidus, nī'dŭs (in Gr. Κνίδος), sometimes written **Gnidos**: an ancient Greek city of Caria, in Asia Minor; on the Ægean Sea and on the promontory of Triopion. It was one of the six cities of the Doric league called *Hexapolis*, and had an extensive commerce. Here were several famous temples of Venus, one of which contained a celebrated marble statue of Venus by Praxiteles. Cnidus was partly built on a small island, connected by a causeway with the mainland. Conon the Athenian defeated the Spartan fleet near Cnidus in 394 B. C.

Coach: See Carriages, etc.

Coadju'tor [Lat. *co-* + *adju'tor*, helper, subst. of *adjuva're*, help]: an assistant; in ecclesiastical law, a term technically applied to one appointed to assist a bishop or other dignitary. Coadjutant bishops in the Roman Catholic Church are usually bishops of sees *in partibus*. In the Protestant Episcopal Church of the U. S. they are called assistant bishops. The first one to be appointed in that Church was Benjamin Moore, who was made assistant to Bishop Provoost, of New York, and the diocesan's resignation of his jurisdiction refused. Since that time there have been many such prelates in this Church, who have been elected with the provision that they are to succeed the diocesan, but until he dies, resigns, or is deposed they perform only such duties as he may assign them. When Bishop Onderdonk, of New York, was suspended, J. Wainwright was given the exercise of all diocesan functions under the title of "provisional bishop." Under the present practice a bishop and his convention may fix the jurisdiction of the assistant and confer a title, usually from some city in the diocese, before the assistant is appointed. In England coadjutor bishops have no official appointment, title, or position, except by a purely private and personal arrangement between the diocesan and themselves. They are usually chosen from among bishops who have retired from colonial or missionary sees.

Coagulation [from Lat. *coagula'tio*, deriv. of *coagula're*, to curdle, *coa'gulum*, rennet; *co-*, together + *a'gere*, drive]: the changing of a liquid to a substance of semi-solid or curd-like consistency (the clot). Thus the white of an egg becomes solidified on the application of heat. The casein of milk is coagulated (curdled) by the action of rennet and by many acids. The fibrin in the blood, chyle, and lymph is coagulated after the removal of these fluids from the living animal. Coagulation of the blood has received a very great amount of patient study, and still there appears to be much obscurity. Fibrin does not exist as such in the blood, but is formed by the union of certain other substances. These seem to be fibrinogen, a substance found in the plasma of the blood, and fibrinoplastin, found in the white corpuscles, the whole process being stimulated by a ferment also found in the white corpuscles. In inflammation and inflammatory diseases the blood contains an excessive amount of the fibrin factors, and therefore the blood readily coagulates. Much importance was formerly attached to the rapidity of coagulation and the appearance of the clot. This was in the days of excessive phlebotomy, but to-day little, perhaps too little, is thought of the coagulability of the blood. In pneumonia, which is a decidedly inflammatory disease, the coagulability is so much increased that clots form within the heart, and the usual cause of death is failure of the heart from heart clots and general weakness. In certain other diseases, like Hæmophilia (*q. v.*), the blood does not clot readily, and hæmorrhages, in part due to the condition of the blood, are constantly seen. Coagulation is most important to the surgeon, for this alone makes amputations or any operations possible. Revised by William Pepper.

Coahuila, kō-ä'ä-wee'lä'ä: a northern interior state of Mexico; bordering on the Rio Grande; bounded N. by Texas, E. by Tamaulipas and Nuevo Leon, S. by San Luis Potosi and Zacatecas, and W. by Durango and Chihuahua. A small area near the center of its western border has independent political rights as the territory of Sierra Mojada. Area of the state, 63,538 sq. miles. The surface is much like that of the adjacent portion of Texas—dry, bare of trees, generally level, but with low, abrupt mountains. The last are most abundant in the central portion. The Rio Salado, a tributary of the Rio Grande, rises in these mountains. The southwestern quarter has several large lagoons which fluctuate greatly in size and form the sinks of extensive independent drainage basins. The mineral wealth is considerable, but the richest region has been segregated in the territory of Sierra Mojada. Cattle, wool, and fruits are the other chief products. The climate is generally temperate and healthy. Pop. (1895) 235,638. Capital, Saltillo, with 17,000 inhabitants. The International Railway crosses the state from Ciudad Porfirio Diaz (Piedras Negras) on the Rio Grande to Torreon in the southwest. M. W. H.

Coahuila Valley: See Colorado Desert.

Coahuiltecan Indians: a linguistic family of Indians; so named by Orozco y Berra in 1864, and Coahuilteco-Tejano by Pimentel in 1865. But the Mexican state of Coahuila, for which the family name was intended, now has a much smaller territory than in the eighteenth century, and the present Coahuiltecan Indians all live in the state of Tamaulipas.

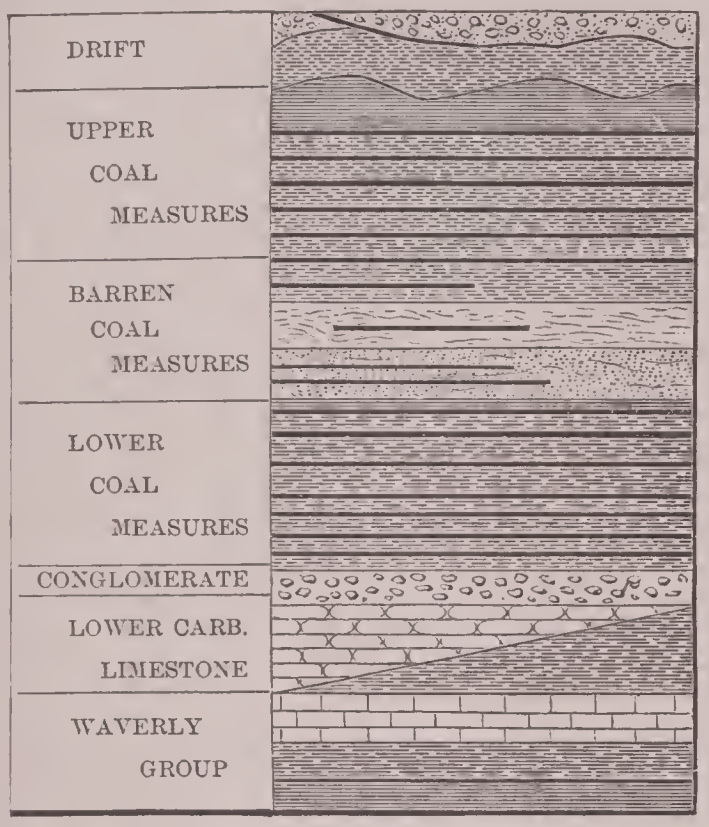
Tribes, Population, Language.—The majority of the tribes belonging to this stock are enumerated in Father Bartolomé Garcia's *Manual*, a sort of catechism dated Queretaro, 1760, and probably composed at the San Juan Capistrano Mission, near San Antonio de Bejár, Texas. Mention is there made of the Pajalates, Orejones, Pacaos (Pakawá, or Pintos, "the tattooed ones"), Pacóas, Telijayas, Alasapas, Pausanes, Pampôpas, and many others. Most of them lived between the Rio Nueces and the Rio Grande, a portion of Texas then belonging to Coahuila province. The feeble surviving remnants of this stock—the Comecrudos, Cotonames, and Pakawá—now live in Mexico between Camargo and Reynosa. They are generally tall in stature, and have an olive complexion. They remember their dialects but imperfectly, their principal means of intercommunication being Spanish, and they seem to have no knowledge of their early homes and migrations. In 1886 their population was about 30, only 10 of whom could converse in the Indian vernacular. The Comecrudo dialect is very simple in its phonetics and in its grammatic forms. See Indians of North America. A. S. Gatschet.

Coal: a name given to several carbonaceous substances derived from vegetable tissue. It was formerly limited to what is now known as charcoal, the residual carbon of wood, from which the volatile constituents have been expelled by heat; but it is at present almost universally used to denote the various kinds of mineral fuel. As these have no definite composition, the vagueness of the term has given rise to much discussion in scientific books and courts of law.

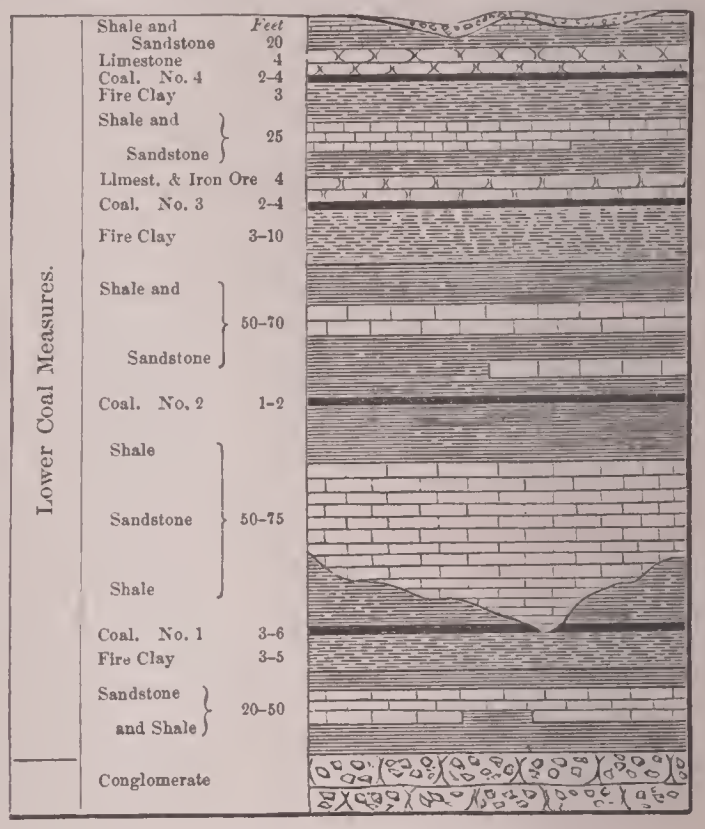
Origin, Theories of.—Mineral coals form part of an unbroken series which begins with woody fiber and ends with graphite. They are all derived from the decomposition of vegetable tissue when buried under water, earth, or rock. The different products of this progressive change, which is a sort of distillation, are peat, lignite, bituminous and anthracite coal, graphite, and asphaltum, which are solids; petroleum and water, which are liquids: carbonic acid, carbureted hydrogen, etc., which are gases. Of these all the solids, excepting asphaltum, are residual products, while that substance and the liquids and gases are the evolved products or distillates. The vegetable origin of coal is accepted generally by naturalists, because of the abundance of well-preserved fragments of plants frequently found in the roof and base shales, and in the partings of the beds, because of the distribution of microscopic fragments of vegetable origin in the coal, and because of the presence of ash in quantity averaging close to that of various vegetable species. Earlier investigators have assumed that coal-beds owed their origin to the decomposition and maceration of enormous forest-growths, while others based theories concerning their genesis upon the discovery in some seams of great quantities of spores, the seeds of lycopodiaceæ. Another hypothesis rested

upon accumulations of marine plants, like the sargassum fields of the Atlantic Ocean. The theory which, however, finds most general acceptance at the present time is that ably presented by Leo Lesquereux, of the Geological Survey of Pennsylvania, that the vegetable matter accumulated in peat-bogs. The accumulations thus formed in different geological periods, but having their greatest development in what is known as the Carboniferous age, were subjected to enormous pressures and to a slow and general distillation, resulting in the different varieties of coal, from the more modern lignite to anthracite and graphite. In isolated instances the chemical changes have been hastened by local volcanic eruptions and lava-streams, and in many districts widespread disturbances of the strata have facilitated the escape of moisture and volatile matter.

All the varieties of coal shade into each other, and we have lignites which exhibit every degree of approach to bituminous coals, semi-bituminous coals intermediate between these latter and anthracite, and graphitic anthracites by which the anthracites are connected with the graphites.



Carboniferous strata—W. Pennsylvania and Ohio.



Coal measures—N. Ohio.

Geological Formation.—The geological position of the different varieties of coal accords with the theory of their origin. For example, the oldest rocks known contain comparatively little carbonaceous matter, as they date from a period when the vegetation of the globe was scanty and mostly marine. Here we have only the residual products of the distillation of vegetable tissue, graphite and anthracite. In the Carboniferous age the terrestrial vegetation was luxuriant over large areas, and conditions prevailed favorable to the formation of beds of peat. These, submerged and deeply buried under sediments which were deposited upon them, have, as a general rule, been changed to our beds of bituminous coal—to anthracite where local causes have carried the process of distillation further. In formations more modern than the Carboniferous the accumulations of vegetable matter are usually classed as lignites. These contain more water and oxygen, and are less valuable fuels than the true coals, but shade into them imperceptibly. In the present period we see the formation of coal only in its initial stages—viz., the growth of vegetation and the accumulation of bitumenized vegetable tissue in peat-bogs and marshes, where oxidation is prevented or retarded by water. By artificial processes we can, however, hasten the changes in vegetable tissue, and by properly conducted distillation produce lignite, bituminous coal, and anthracite. We find, too, that nature is locally accelerating her processes, and by volcanic heat distilling lignites and bituminous coals to anthracite. In Colorado, New Mexico, and on Queen Charlotte's island, excellent anthracite has been produced by volcanic heat from Cretaceous lignites. At Los Bronces, in Sonora, Triassic coal is converted into anthracite by a similar cause. In Eastern America all the coal strata, except those of the small Triassic basins of Virginia and North Carolina, are of Carboniferous age. In the valley of the Mississippi, where they have suffered no local metamorphosis, they are all of the bituminous class. In the Alleghanies the same strata, having been somewhat affected by the causes which resulted in the upheaval of the mountains, have lost a portion of their volatile matter, and have become what are known as semi-bituminous coals. To this group belong the coals of Blossburg, Broad Top, Frostburg, and a belt running down to Alabama. Still farther E. the Carboniferous strata are more metamorphosed, and the coal which they contain is converted into anthracite. In Rhode Island a coal-basin of limited extent, and of the same age with those of Pennsylvania, seems to have been still nearer the focus of metamorphic action; and here the coal is partially converted into graphite, forming the variety known as graphitic anthracite.

The following sections, general and local, will serve to give an idea of the mode of occurrence of coal in the Carboniferous rocks, and of the nature of the associated strata:

As members of the stratified series of rocks the coal-beds were originally deposited horizontally, and large areas are known in the U. S. and elsewhere in which this position has been but little modified. In many cases, however, the strata often have undergone violent flexures and extensive faulting, and they frequently occur in basins. In thickness the strata vary from seams as thin as knife blades to beds above 100 feet through. The beds very rarely consist of one uniform mass of coal, but are subdivided by layers or strata of slate called "partings," and often these layers differ in physical structure and chemical composition. The coal itself is generally weathered along the outcrop, deteriorating it so that explorations must generally be carried to varying depths under cover before the fresh coal and its true value can be determined. In nearly all coal-fields there are a number of beds. The minimum workable thickness depends upon a large number of contingencies, the character of the foot, wall, and roof, the distance from market, the quality of the coal, the supply of labor, the flow of water, etc. Mining is rarely carried on in seams smaller than $3\frac{1}{2}$ to 4 feet. See MINING.

Chemical Constitution.—Chemically, coal is not a compound of free carbon with volatile hydrocarbons, but is regarded by more recent authorities, like Muck, as a mixture of a large series of hydrocarbons. The constituents producing the ash are derived both from the original vegetable tissues from which it was formed and from mechanical admixture of the mineral substances constituting the rocks in which the seams were imbedded. Sulphur, generally present, and important as affecting the economical value of the fuel, is partly traceable to true chemical combination with the hydrocarbons and partly to admixture of iron pyrites,

the latter being often found on strata and seams and in concretions of larger size.

Structurally, coal is often split up into cubes by innumerable cracks and seams, which often greatly facilitate the mining, but at times seriously interfere with the marketing of the coal. The fine coal or slack is frequently unsalable, and when it can not be used for coking represents so much waste. Some coals are hard and bear long transportation, others are fragile and do not bear carriage to distant markets. All coals deteriorate, so far as their fuel value is concerned, by prolonged exposure to the atmosphere; this loss of calorific efficiency through weathering being strongly marked in some varieties, while it is of little practical significance with others.

The spontaneous ignition of coal, which is particularly dangerous to vessels laden with fuel for distant ports, has been frequently attributed to heating caused by the oxidation of the pyrites it contains. More recent investigators incline to regard the oxidation and ignition of the lighter volatile hydrocarbons as the cause. Thorough ventilation is now acknowledged to be the best preventive measure.

Industrial Values.—The value of coal in the economy of civilization is now so well understood and so fully appreciated that it requires no lengthy exposition. In its combustion the heat of the sun, absorbed in the growth of the plants from which it is derived, is all given out again, subject to human control; and, as heat is but another name for physical force, coal becomes the most important source of power at our command. The power developed in the combustion of a pound of coal is theoretically equal to 11,580,000 foot-pounds. But by our imperfect methods of utilization not more than 1,500,000 foot-pounds are made available. This is about the amount of power exerted by a man of ordinary strength during a day of labor. Hence 300 lb. of coal will represent the labor of a man for a year. The current production of coal in the world is about 500,000,000 tons. While we possess no recent statistics of the percentage of consumption for power purposes, a fair estimate is one-quarter of the whole output for driving stationary locomotives and marine engines. This is equivalent to the labor of over 800,000,000 men who are producers and not consumers.

For the calculation of the calorific value of coal the Dulong formula has been used for a long time. It is:

$$CV = \frac{8080\ C + 34{,}462\ (H - \frac{1}{8}\ O)}{100}.$$

(C = per cent. carbon, H = per cent. hydrogen, and O = per cent. oxygen.) By dividing the calorific value thus obtained by 637, the quantity of carbon is obtained which converts water at the freezing-point into steam. Favre and Silbermann, Regnault, Berthelot, Scheurer-Kestner and Meunier, Gruner, Johnson, and others have made researches reviewing Dulong's formula, which resulted in showing that the practical calorific value is two-thirds of the theoretical thus calculated.

The distillation of coal in the manufacture of illuminating gas has been largely superseded by the manufacture of water-gas, subsequently enriched by naphtha. The tar produced in the distillation of gas-coals by the older method of manufacture forms the raw material for the great aniline industry, the annual profits of which in Germany are said to be greater than the sums paid to scientists engaged in original research in the German universities.

Distribution, General.—Such being the value of coal, its geographical distribution becomes of great interest and importance. Among the nations of Europe the British occupy a pre-eminent position, not only from the extent of their coal-fields, but from the industries dependent upon them. The British coal area is estimated to be 11,859 sq. miles. The coal area of France is about 2,000 sq. miles. Belgium has a coal area estimated at 500 sq. miles. In Prussia the coal area is 2,000 sq. miles of very deep and valuable coal strata. The coal area of Spain is not definitely known. Her coal-field in the province of Asturias is important, but as yet her coal production is small. Austria has 1,800 sq. miles of coal territory. Recent discoveries have shown that Russia has much larger coal-fields than were formerly credited to her, and it is estimated that she has 20,000 to 30,000 sq. miles of coal strata of different ages.

Coal also occurs in China, India, Australia, Japan, and Borneo. So far as known, it is all of Mesozoic age, though in China and Japan anthracite and well-formed bituminous coals are found, and have been worked for centuries.

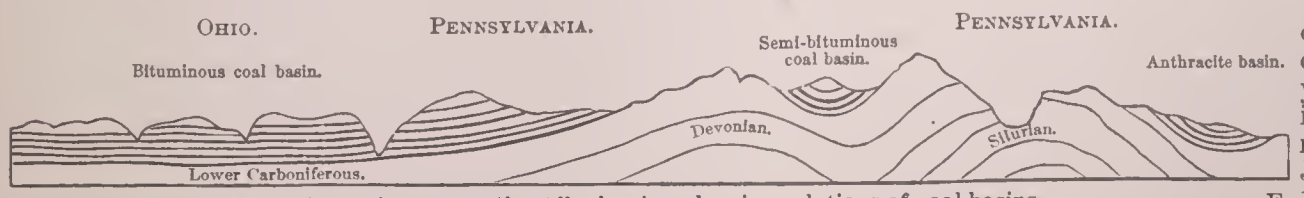
Production.—The following table gives the world's production in short tons for the years named:

United States (1899)	tons.	253,739,992
Great Britain (1899)		246,495,539
Germany (1899)		149,719,766
Austria-Hungary (1898)		41,652,569
France (1898)		35,656,426
Belgium (1899)		24,159,925
Russia (1898)		14,173,960
Canada (1899)		4,925,051
Japan (1897)		6,225,516
India (1898)		4,707,582
New South Wales (1899)		5,148,671
Spain (1899)		3,022,113
New Zealand (1898)		1,015,591
Sweden (1898)		260,448
Italy (1898)		376,245
South African Republic (1898)		2,136,143
Queensland (1898)		456,757
Victoria (1898)		275,138
Natal (1898)		434,348
Cape Colony (1898)		191,857
Tasmania (1898)		49,138
Other countries		2,240,000
Total		797,062,775
Percentage of the U. S.		32

United States.

Production.—When we turn to the U. S. we find a coal area which throws all those which have been mentioned into insignificance, and coal-fields which, although shallow compared with those of Nova Scotia and parts of Europe, are the most extensive and richest in the world.

STATES AND TERRITORIES.	1889.	1899.
Bituminous.		
Alabama (tons)	3,572,983	7,593,416
Arkansas	279,584	843,554
California and Oregon	184,179	160,972 / 86,888
Colorado	2,544,144	4,776,224
Georgia and North Carolina	226,156	260,007
Illinois	12,104,272	24,439,019
Indiana	2,845,057	6,006,523
Indian Territory	752,832	1,537,427
Iowa	4,695,358	5,177,479
Kansas and Nebraska	2,222,443	3,852,267 / .....
Kentucky	2,399,755	4,607,255
Maryland	2,939,715	4,807,396
Michigan	67,431	624,908
Missouri	2,557,823	3,025,814
Montana	363,301	1,496,471
New Mexico	486,463	1,050,714
North Dakota	28,907	98,809
Ohio	9,976,787	16,500,270
Pennsylvania	36,174,089	74,150,175
Tennessee	1,925,689	3,330,659
Texas	128,216	883,832
Utah	236,651	786,049
Virginia	865,786	2,105,791
Washington	1,030,578	2,029,881
West Virginia	6,231,880	19,252,995
Wyoming	1,388,947	3,837,392
Total bituminous	95,629,026	193,321,987
Anthracite.		
Pennsylvania (tons)	45,544,970	60,418,005
Colorado and New Mexico	53,517	.....
Rhode Island	2,000	.....
Total anthracite	45,600,487	60,418,005
Grand total	141,229,513	253,739,992



W. Profile section across the Alleghanies, showing relations of coal basins.

The production of coal in the U. S. during the fiscal year 1889, according to the census report of John H. Jones, and during E. 1899, according to the report of E. W. Parker to the U. S. Geological Survey, is shown in the table given above. In the latter report the anthracite product outside of Pennsylvania is included in the general total.

The distribution of the coal product was as follows:

DISTRIBUTION.	1889.		1899.	
	Anthracite.	Bituminous.	Anthracite.	Bituminous.
Loaded at mines for shipment.....tons.	40,166,818	73,609,883	47,088,581	133,871,530
Sold to local trade.....	1,163,889	6,418,647	1,238,066	7,687,848
Used by employees.....	327,491	598,672		
Used for steam at mines...	3,942,289	1,439,976	5,055,997	2,865,292
Manufactured into coke....	.....	13,561,848	.....	22,167,353

Labor and Wages.—The census reports show in detail the number of men employed in the collieries, the length of employment, and the average wages. In the calendar year 1889 there were employed above ground 2,285 foremen, 8,603 mechanics, 38,413 laborers, and 17,836 boys under 16 years; below ground there worked 2,859 overseers, 158,060 miners, 58,771 laborers, and 9,796 boys: total, 296,623 employees, to whom an aggregate of $106,937,058 was paid in wages. The data for the leading producing States are given below:

EMPLOYEES.	Pennsylvania, anthracite.	Pennsylvania, bituminous.	Illinois.	Ohio.
Above ground.				
Foreman and overseers:				
Number.....	564	378	217	221
Av. wages per day.....	$2 71	$2 57	$2 34	$2 26
Av. no. of days worked.	291	250	262	244
Mechanics:				
Number.....	4,720	1,028	625	334
Av. wages per day.....	$1 92	$2 11	$2 03	$1 91
Av. no. of days worked.	257	237	266	235
Laborers:				
Number.....	23,779	3,366	1,678	1,420
Av. wages per day.....	$1 29	$1 67	$1 52	$1 51
Av. no. of days worked.	198	208	201	192
Boys under 16 years:				
Number.....	17,091	207	64	83
Av. wages per day.....	$0 62	$0 86	$0 80	$0 77
Av. no. of days worked.	185	200	200	187
Below ground.				
Foremen and overseers:				
Number.....	737	606	305	221
Av. wages per day.....	$3 05	$2 56	$2 38	$2 32
Av. no. of days worked.	291	256	256	245
Miners:				
Number.....	36,739	40,100	15,386	14,733
Av. wages per day.....	$2 40	$1 93	$1 98	$1 95
Av. no. of days worked.	179	210	177	181
Laborers:				
Number.....	35,376	5,303	5,062	1,955
Av. wages per day.....	$1 63	$1 85	$1 77	$1 63
Av. no. of days worked.	184	220	199	185
Boys under 16 years:				
Number.....	4,770	2,144	597	376
Av. wages per day.....	$0 89	$0 78	$0 90	$0 73
Av. no. of days worked.	180	217	176	181
Total employees.....	123,676	53,132	23,934	19,343
Total wages in 1889.....	$38,867,331	$20,327,805	$8,429,553	$6,730,778

These figures may be accepted as fairly representative of the wages earned and the average number of days of employment. The boys enumerated as working above ground at the anthracite collieries are employed chiefly as slate-pickers in the coal-breakers. Those working underground are generally engaged in watching ventilation-doors.

Cost of Production.—For some of the leading States the expenditures incurred in mining, according to the preliminary reports of the census office for 1889, the final figures, including those for the Pennsylvania mines, not having been published (1893), are tabulated as follows:

STATES.	Wages.	Salaries to office force.	Supplies.	To contractors.	All other mining expenses.	Total mining expenses.
Pennsylvania anthracite..	.....	.....	.....	.....	.....	.....
Pennsylvania bituminous.	.....	.....	.....	.....	.....	.....
Maryland....	.....	.....	.....	.....	.....	.....
Illinois.....	$8,429,553	$264,794	$966,927	$26,662	$678,133	$10,366,069
Ohio.....	6,730,778	161,826	568,020	58,767	702,792	8,232,183
Indiana.....	2,144,566	56,478	241,094	5,807	133,724	2,581,669
West Virginia	3,748,721	139,991	462,591	47,099	443,394	4,841,796
Kentucky....	1,669,524	86,839	237,321	45,099	117,765	2,156,548
Tennessee....	1,548,392	60,918	271,390	13,324	219,268	2,113,292
Virginia.....	604,796	16,470	46,754	932	13,456	682,408
Alabama.....	.....	.....	.....	.....	.....	.....

Out of total expenditures, for the States enumerated, of $30,973,965, the outlay for wages was $24,876,330, thus showing that the labor cost is 80·3 per cent. of the total.

Classification.—Prof. Persifor Frazer, of Philadelphia, has suggested a classification of coals based upon the ratio of fixed carbon to volatile hydrocarbons. He has proposed the following:

CLASSES OF COALS.	Ratio, fixed c. to vol. hydroc.
Hard-dry anthracites.....	from 99 : 1 to 12 : 1
Semi-anthracites.....	" 12 : 1 to 8 : 1
Semi-bituminous.....	" 8 : 1 to 5 : 1
Bituminous.....	" 5 : 1 to 0 : 1

Arbitrary commercial divisions are, however, locally made, which do not accord with the classifications established by scientists.

The most recent and comprehensive classification of the bituminous coal-fields of the U. S. has been made by the late Charles A. Ashburner, with an estimate of the areas of some of the fields:

	Area, sq. miles.	
(1) *Triassic*:		
Virginia.....	180	
North Carolina.....	2,700	
		2,880
(2) *Appalachian*:		
Pennsylvania.....	9,000	
Ohio.....	10,000	
Maryland.....	550	
Virginia.....	185	
West Virginia.....	16,000	
Kentucky.....	9,000	
Tennessee.....	5,100	
Georgia.....	200	
Alabama.....	8,660	
		58,695
(3) *Northern*:		
Michigan.....	6,700	
		6,700
(4) *Central*:		
Indiana.....	6,450	
Kentucky.....	4,000	
Illinois.....	36,800	
		47,250
(5) *Western*:		
Iowa.....	18,000	
Missouri.....	26,700	
Nebraska.....	3,200	
Kansas.....	17,000	
Arkansas.....	9,100	
Indian Territory.....	20,000	
Texas.....	4,500	
		98,700
Total area.....		214,225

(6) Besides the *Rocky Mountains* includes large coal-fields in North Dakota, Montana, Idaho, Wyoming, Utah, Colorado, and New Mexico, the areas of which are not even approximately determined; and (7) the *Pacific coast* includes coal areas in Washington, Oregon, and California.

The first five groups embrace an area of 214,225 sq. miles. It is surmised that the sixth group has between 200,000 and 300,000 sq. miles more, while not even a guess has been made concerning the seventh.

Triassic Field.—The eastern Triassic area is composed principally of the Richmond basin in Virginia and the Deep river and Dan river fields in North Carolina, the former having been one of the earliest districts developed in the U. S. It produced 28,353 tons in 1899, and is only slightly developed.

Appalachian Field.—The Appalachian field, from which 129,843,906 tons of coal were mined in 1899, lies immediately W. of the eastern frontier of the Appalachian Mountains, and extends from the State of New York to the State of Alabama, its length being a little over 900 miles in a N. E. and S. W. direction, and its width varies from 30 to 180 miles. All the coals are bituminous and are of great variety, both in chemical composition and physical structure. Although it is difficult to make any general comparisons, the best and most productive coal-beds lie probably in the Pittsburg district and in West Virginia. Some of the best coals in the field are mined in basins detached from the main body of the field, such as the Blossburg and Broadtop basins in Pennsylvania, and the Cumberland in Maryland. The thickness of the coal measures in the different sections of the field varies from 100 to over 3,000 feet.

Northern and Central Fields.—The coal of the northern field is inferior and is mined only for local consumption.

The central field, in which there were mined 33,181,247 tons in 1899, includes the coal areas of Indiana, Illinois, and Kentucky. On account of the great extension of the field in that State it is often simply called the Illinois field.

Western Field.—The most extensive mining operations in the western field are carried on in Iowa and Missouri. The best coal so far mined is that from the Indian Territory, the total product of the field in 1899 having been 15,320,393 net tons. The coals are of great variety, and, since the

region in which they lie is a rich agricultural country, it is probable that the beds will be very extensively developed to supply local demands.

In the Rocky Mountains the coal-beds have been found in the geological formations from the Carboniferous to and including the Cretaceous. They include large areas of lignites.

Pennsylvania.—The Pennsylvania bituminous coal formation has been divided by the Geological Survey of that State into—1, the Upper Barren Measures; 2, the Upper Productive or Monongahela River Series, containing the Waynesburg, Uniontown, Sewickley, and Redstone coal-beds and the famous Pittsburg bed at its base; 3, the Lower Barren Measures; 4, the Lower Productive or Alleghany River Series, including the Freeport group at the top with three coal-beds, the Kittanning group in the middle with three coal-beds, and the Clarion group at the bottom with three coal-beds: but of these nine coal-beds not more than two, or at most three, are anywhere found workable directly one over another, so great is their variability in size and quality; 5, the Pottsville Conglomerate Series (No. XII.), containing small beds of coal and resting on the Sharon coal-bed, celebrated for its black coal in Ohio but worthless in Pennsylvania except in Mercer County; 6, the measures down to and including the Pocono sandstone (No. X.). As indicating the enormous amount of coal, it may be stated that Dr. H. M. Chance in 1881 estimated the tonnage of available bituminous coal in Pennsylvania at 33,547,200,000 tons, of which nearly one-third was assigned to the Pittsburg bed.

In Pennsylvania the most important bed is the Pittsburg, in Connellsville, varying in thickness between 6 and 12 feet, the coal containing from 59 to 64 per cent. of solid carbon, 30 to 24 per cent. of volatile matter, 3 to 6 per cent. of ash, 1 per cent. of sulphur, and 1 per cent. of water. It is mined in the Monongahela river coal region, which ships upward of 4,000,000 tons annually by river alone to the markets along the Ohio and Mississippi rivers to New Orleans. From it come the coals which are manufactured into coke in the great Connellsville region, and the steam and gas coals of Allegheny and Westmoreland Counties. The Moshannon, or Lower Freeport, 3 to 5 feet thick, and the Lower Kittanning beds are mined in the Clearfield districts, which is one of the principal sources of supply for the Atlantic coast trade, the total shipments of the district having been about 5,500,000 tons in 1899. A third leading district is the Reynoldsville of Jefferson County, in which the Lower Freeport is mined, the coal being shipped chiefly for steam purposes to Buffalo and the lakes, Western New York, and New England. The annual production is about 4,500,000 tons.

Maryland.—One of the most important coal districts in the Appalachian field is the Cumberland, Frostburg, or George's Creek, in Western Maryland, 20 miles long, with an average width of 4½ miles. The bed, which dips steeply, varies in thickness, but is generally thicker than the Pittsburg bed which it represents. The product is a famous steam coal used largely in the Atlantic tidewater trade. The 1899 output was about 6,000,000 tons.

The Virginias.—The youngest and most vigorous competitor for the seacoast trade is the Pocahontas Flat Top region, which is situated along the line separating the two Virginias, in Tazewell co., Va., and Mercer and McDowell cos., West Va. It produces a coal of exceptional purity, making an excellent coke, from the great Pocahontas or No. 3 bed, which is 10 to 12 feet thick, and in some portions of the field is split into two distinct workable seams, yielding about 9 feet of coal. It is cheaply mined, not requiring any pumping. The district in 1899 shipped nearly 1,800,000 tons of coal and 400,000 tons of coke, and is expanding rapidly.

West Virginia is pre-eminent for its coal resources, the Pittsburg seam underlying the whole northwestern half of the State. Mining is on a large scale in the Kanawha and New River valleys, where a gas-coal seam, running from 4 to 7 feet in thickness, is quite cheaply produced and is largely shipped by river, being a formidable competitor in the lower markets of the Monongahela district in Pennsylvania. The shipments from the Kanawha and New River districts in 1899 were 6,544,956 tons; the Flat Top district, 6,033,344 tons; and the Fairmount and Elk Garden districts, 5,160,192 tons. The Elk Garden district is contiguous to the Cumberland district of Maryland and supplies the same markets.

Kentucky.—Kentucky includes in its boundaries portions of both the Appalachian and the Central field and has shared in the generally rapid development of the coal resources of the Southern States during the past few years. In the eastern area, which is a part of the Appalachian field, the coal-beds lie stratigraphically in two subdivisions, the upper of which represents the lower coal measures of Ohio, West Virginia, and Pennsylvania, and the lower the conglomerate and subconglomerate coals.

Tennessee.—The coal of Tennessee is confined to what is known as the Cumberland plateau, which is broken into by the Sequatchie valley. That part of the plateau to the W. of the valley retains the name Cumberland, while that to the E. is generally known as Walden's Ridge. A large percentage of the coal mined is used for the manufacture of coke for the blast furnaces of the State.

Alabama.—The coal measures of Alabama occupy the extreme southern part of the Appalachian coal-field, and include the Warrior, Cahawba, and Coosa districts, so named after the rivers which drain them. The area of the first is nearly ten times that of the latter two combined, and practically supplies alone the fuel for the great Birmingham iron industry, the coal for coking being mined from the Pratt seam, which averages 4 to 4½ feet in thickness. The total product in 1899 was 7,593,416 tons, of which 2,656,296 were made into coke. The Alabama mines during the past few years have developed an important trade with the countries on the Gulf of Mexico.

Ohio.—More than one-fourth of the State of Ohio is underlaid with coal-bearing strata. The coal measures are divided into three series: the Lower, about 500 feet in thickness; the Barren, 400 to 500 feet thick; and the Upper, 600 feet in thickness. The coal is now chiefly drawn from four to five different seams. The coal-producing portions of the State are divided into twelve districts: 1, Jackson; 2, Ohio valley, including Lawrence, Gallia, Meigs, Monroe, Belmont, Jefferson, and Medina Counties; 3, Hocking valley, including Vinton, Hocking, Athens, and a part of Perry Counties; 4, Cambridge, in Guernsey County; 5, Macksburg, including Washington and Noble Counties; 6, Carrollton valley, in Harrison County; 7, Muskingum valley, including Muskingum and a part of Perry Counties; 8, Tuscarawas valley, including Coshocton, Tuscarawas, Stark, Summit, and Wayne Counties; 9, Salineville, in Columbiana County; 10, Carrollton valley, in Carroll County; 11, Mahoning valley, including Mahoning and Trumbull Counties; and 12, Palmyra, in Portage County. Among these, the most important, their production in 1899 being appended, are the following: Jackson, 2,032,233 tons; Ohio valley, 2,762,186 tons; Hocking valley, 3,876,745 tons; Muskingum valley, 1,878,132 tons; and Tuscarawas valley, 2,533,488 tons—about 80 per cent. of the total product of the State.

The Central field includes the coal areas of Indiana and Illinois, and a part of the coal area of Kentucky.

Illinois.—Sixty counties of Illinois are underlaid with coal, the field containing sixteen distinct seams of bituminous coal, furnishing an excellent steaming fuel, but little suitable for coking or gas-making. The beds which are available for mining generally lie at considerable depth and are reached by shafts. The Carboniferous system has an aggregate thickness of between 1,200 and 1,400 feet in Southern Illinois, while in the northern portion of the State the entire thickness of the system does not exceed 600 to 800 feet. The seams are numbered from the base to the top, No. I. being the characteristic coal of Rock Island and the adjoining counties. Bed No. II. has its greatest development in the Big Muddy region. Bed No. V. is chiefly mined in Sangamon and Macoupin Counties, while No. VI. is most extensively worked in the Belleville district, E. of St. Louis, where it is 6 to 8 feet in thickness, and is easily mined. No. VII. has its maximum development in Williams County in the southern part of the State. The other beds are rarely of any importance.

Indiana.—The Central field extends eastward over the southwestern portion of Indiana, and includes nineteen counties, Warren County lying at the northern limit and a line drawn through the eastern boundary of Greene County marking its extent eastward. The coal measures are only 650 feet in thickness, and include eleven beds, aggregating 20 to 30 feet of coal, in strata about 260 feet thick. They are designated by the letters A to N inclusive, no beds having been discovered, however, to represent the letters C, D, and E. The principal seams worked are J and I, ranging between 3 ft. 3 in. and 5 feet, which produce the "block" coal, and L, or the Staunton bed, which is 3 feet to 7 feet thick, yielding bituminous coal.

Kentucky.—The Central field covers also that part of

Kentucky which lies S. of the Ohio river, between the Rolling Fork and Cumberland rivers. The thickness of the coal measures is about 600 feet. Twelve coal-beds are identified in this district, but only five are worked to any extent. In the western as well as in the eastern district in the same State are found some of the finest beds of cannel coal known in the country, which is distributed widely for domestic grate fuel in the Eastern cities, and has been shipped abroad into markets hitherto controlled by English cannel.

Iowa.—The coal-field of Iowa forms the northern part of the Western, or, as it is frequently called, the Fourth Coal-field of the U. S. The coal measures of the State have been divided into three groups, the Upper, Middle, and Lower, the former occupying the southwestern corner of the State and carrying only one insignificant bed, and the middle measures cropping out along the line of the Des Moines river, from a little above Fort Dodge to near Keokuk, throughout a belt of country some 50 miles in width. These are the measures which contain all the larger beds of coal in the State. In the main coal-field are eight counties which have beds ranging from 5½ to 9 feet in thickness. The coal is of a quality generally well adapted for steam and heating purposes. No cannel or gas coal is found in the State.

Missouri.—A line drawn from the junction of the Des Moines river with the Mississippi to the southwest corner of Missouri will have N. W. of it nearly all the coal territory of the State. An arm of this territory, however, follows the course of the Missouri river E. for a short distance, and coal is found in the vicinity of St. Louis. The lower coal series is considered to contain the most important and the most productive coal-beds. The coal is semi-bituminous, and is adapted for steam and heating purposes, as well as for smithing.

Nebraska.—The southwestern corner of Nebraska is covered by a portion of the Missouri coal-field, but the outcrops belong entirely to the upper measures, and no deposits of value have yet been discovered in this State.

Kansas.—The coal measures of Kansas underlie the entire eastern part of the State, and have been divided into—1, the Cherokee and Crawford County coal-field; 2, the Osage, Shawnee, and Coffey County field, the most important; 3, the Neosho County field; 4, the Franklin County field; and 5, the Bourbon and Linn County field. The coals are bituminous in character, similar to the coals of other States in the Western field, and are found to be excellent for coking, steam, gas, smelting, and domestic purposes. Lignite deposits have also been worked to some extent for local trade along the western limits of the coal areas in Cloud, Republic, Ellsworth, Russell, and Jewell Counties. In the coal measures there are 22 different seams, varying from a few inches to 7 feet; ten of these are over a foot thick.

Arkansas.—The coal deposits of Arkansas are located in the western part of the State, upon either side of the Arkansas river, extending with more or less persistency between Fort Smith and Little Rock. The principal districts in the State are—1, the Western, or Sebastian County district; 2, the Coal Hill; 3, the Philpott; and 4, the Ouita district. The beds vary in thickness from 20 inches to 7 feet. The coal is mostly semi-bituminous, but much of it deserves to be classed as semi-anthracite.

Indian Territory.—The coals mined in the Choctaw coal-fields, Indian Territory, are pronounced by far the best mined in the Southwest, and vastly superior to Kansas, Missouri, and Iowa coals. The Choctaw field is a direct westward extension of the Arkansas coal-field, but its coals are not like those of that State, except in the county immediately adjoining the line. Dr. H. M. Chance estimates that the coal measures are at least 8,500 feet thick. They include the Grady group of coals at the bottom of the series, and above them, in succession, are the McAlester coal, 4 feet thick; the Norman coal, 3 feet thick; the Secor coal, 2½ feet thick; and the Mayberry, 4 to 6 feet thick.

Texas.—The principal body of bituminous coal in Texas lies in the northern central portion of the State, extending S. W. from the Red river, in Montague County, to the Colorado river, this basin forming the southern extremity of the Western field. Along the Rio Grande lies another, called the Nueces coal-field, the lower measures yielding a fair semi-bituminous product, while the upper measures are somewhat lignitic. An extended area, bounded by lines drawn from Clarksburg in Red River County southwesterly to the Rio Grande and thence N. E. to the Sabine river, is said to contain important deposits of lignite.

The Dakotas.—Very little mining has thus far been done in North and South Dakota in the Rocky Mountain field. The ascertained coal areas lie in the western counties between a line drawn from the Turtle Mountains in the N., through Burleigh County, to the southern borders of the Black Hills and the western boundary-line. The seams of what is a fair lignite vary from a few inches to 12 feet.

Montana.—Montana possesses quite extensive coal and lignite fields, among them the Bozeman, with their distinct beds, producing good coal which makes fair coke, and the Judith, Belt creek, Sand Coulée and Deep creek field in which the lignite lies under the prairie. Besides these there are the Rock creek field, with seven workable seams aggregating 46 feet, and the Gardiner field on the upper Yellowstone.

Wyoming.—The coal-fields of Wyoming are of great extent, but no systematic surveys have been made of all the areas which will permit of an estimate as to their size or the relative value of the beds which they contain. The coal is a typical lignite, which is mined quite largely in Carbon County, where the bed is 9 feet thick, at Rock Springs, Sweetwater County, and at Almy, Minta County. Quite recently important developments have been made near Newcastle, Weston County, where the lignite has been partially metamorphosed to a coking coal by heat.

Colorado.—The coal resources of Colorado are particularly extensive and varied, the beds of the State furnishing the entire range of coal from lignite to anthracite. The State is grouped in four divisions—the Northern, including Weld, Boulder, Jefferson, Arapahoe, and Routt Counties, furnishing lignite of fair quality, except in the last-named county, where some anthracite is found. The veins worked range in thickness from 3 to 12 feet, the principal mining operations being in Boulder County. The Middle Division includes Park, Fremont, Douglas, and El Paso Counties. The former, which predominates as a producer, furnishes a fair semi-bituminous coal, while the cañon coal from Fremont County ranks among the first for domestic purposes. The other counties mine some average grade lignite. The Southern Division is the most productive in the State, including Huerfano County, with the Rouse, Walsenburg and Soma mines, Las Animas County with the El Moro coking coals, La Plata and Dolores Counties. The field of the Western Division, in Pitkin, Garfield, Mesa, and Gunnison Counties, is remarkable from the fact that it produces anthracite coking and non-coking coals, the alteration being chiefly due to the vast eruptions of porphyries which built the Elk Mountains.

Utah.—The principal producing mines of Utah are at present confined to Summit, Sanpete, and Emery Counties. It is estimated that the following areas in Utah are underlaid with coal: 500 sq. miles in the vicinity of Sunnyside and Castle Gate; 200 sq. miles on the Weber river and its tributaries; Grass creek, Chaw creek, etc., from 100 to 200 sq. miles in the vicinity of Pleasant valley; 150 sq. miles back of Cedar City; and 1,000 sq. miles in Castle valley.

New Mexico.—The New Mexican coals range through all the varieties from lignite to anthracite. The principal districts are the Raton, from which a coking coal is obtained, and the Gallup, in Bernalillo County, where lignite is mined from two beds. The Cerillos district produces both bituminous and anthracite coal.

Pacific States.—Although coal deposits of more or less importance have been discovered in many of the counties of California W. of the Sierras, from Siskiyou in the vicinity of Mt. Shasta in the north to San Diego in the south, no mining operations upon a commercial scale have been prosecuted, except in Amaden and Contra Costa Counties. In Oregon outcroppings of coal have been found in nineteen counties, both E. and W. of the Cascade Range, but mining operations are reported only in Coos County. Washington is known to possess very extensive deposits of lignite, semi-bituminous, and bituminous coal, and several important coal areas have been opened both on the western and the eastern slopes of the Cascade Range. See map of North America for coal-fields.

Uses of Varieties.—The different chemical and physical properties exhibited by the various kinds of coal fit them for a wide range of uses in the arts. Coals are primarily divided into two great groups—the hard and soft, or the anthracite and bituminous coals—but each of these groups is capable of subdivision into several varieties. For example, we have at the base of the series—1. *Graphite*, which is a coal deprived of all its volatile matter, and consisting only of a por-

tion of its carbon, mingled with all its ash. This is practically incombustible, and is never used as a fuel or classed as a coal. 2. *Graphitic anthracite*, containing 1 or 2 per cent. of gaseous matter, igniting with difficulty, and forming an inferior fuel. This is the prevailing variety of coal in the Rhode Island coal basin. 3. *Anthracite*, containing from 3 to 10 per cent. of volatile matter, sometimes 95 per cent. of carbon. (See ANTHRACITE.) 4. *Semi-bituminous coal*, containing from 10 to 18 per cent. of gaseous matter, but generally caking in the fire; of little value as an illuminator, but kindling readily, with high heating power. It is the most highly valued of all coals for the generation of steam. The semi-bituminous coals produce a dense coke, and in the raw state are preferred to all others for blacksmiths' use, as they form a hollow fire and produce intense heat in combustion. 5. *Bituminous coals*, which have been subjected to no local metamorphic action, but are the natural product of the slow and general distillation of vegetable tissue buried in the earth since the Palæozoic ages. In bituminous coals the volatile matter varies in quantity from 18 to 50 per cent. of the mass. They are subdivided into *coking*, *furnace*, and *cannel* coals. Of these the coking coals melt and adhere in burning, and when the gaseous matter has escaped a mass of "coke" is left which has the properties of anthracite, but is cellular or spongy from the expansion of the gases. (See COKE.) Most bituminous coals belong to this variety, of which the Pittsburg coal may be taken as a type. They are extensively employed for the generation of steam, as household fuels, and, when coked, for smelting the metals, their adhesive character preventing their being used for this purpose in the raw state. Caking coals which are sufficiently free from sulphur, their great contaminating ingredient, are termed "gas coals," as they were chiefly employed for the production of illuminating gas. In the volume and illuminating power of their gas they are exceeded by the cannel coals, but their deficiency in this respect is more than compensated for by the greater value of the coke which is derived from them. The furnace coals are those bituminous coals which do not melt or adhere in the fire, and can therefore be employed in the raw state in the blast furnace. These are termed *open-burning* and sometimes *splint coals*, but the latter term is more appropriately applied to a kind of cannel coal which contains a large percentage of carbon, comparatively little gas, and has high heating power. The famous Brier Hill coal of Ohio and the Brazil coal of Indiana are typical furnace coals. The cannel coals have a more homogeneous texture, and are less pitchy and brilliant than the other bituminous coals. They represent the carbonaceous mud which accumulated in the open lagoons of the coal marshes, while the surrounding mass of spongy vegetable tissue formed the cubical coal. The cannels are rich in gas, but have comparatively low heating power. They are favorite household fuels, and have been employed for the production of oil by distillation, but are nearly valueless for metallurgical purposes. Nearly all coal-fields contain more or less cannel, which is either interstratified with the cubical coal or gradually passes into it in one or another direction. As a general rule, the cannels contain more ash than the furnace or gas coals; and as the earthy matter increases in quantity, they shade off imperceptibly into bituminous shale.

Revised by C. KIRCHHOFF.

Coalfish: an English name for the pollack, *Gadus*, or *Pollachius*, *virens*, a fish nearly related to the common cod. Given on account of the dark color of the back, due to a peculiar pigment, which rubs off on the hands when the fish is handled. The coalfish is found on both sides of the North Atlantic, and is taken in considerable quantities for food, being used fresh, salted, or dried. Its average weight is 10 or 12 lb., but it sometimes reaches 20 lb. The oil derived from the liver is used in the adulteration of codliver oil. F. A. L.

Coal-gas: See GAS-LIGHTING.

Coal Measures: See CARBONIFEROUS PERIOD.

Coal-oil: See PETROLEUM.

Coal-tar: a substance obtained in the manufacture of illuminating gas from coal. It is thick, black, and sticky, and consists of a very large number of compounds, many of which are now isolated from it and furnish the foundation of important industries. Pre-eminent among the compounds obtained from coal-tar are benzene, toluene, xylene, phenol or carbolic acid, naphthalene, anthracene, etc. The statement that a thing is "made from coal-tar" should be understood as meaning that the thing itself is generally not contained in the tar, but it is made from some one or more of the things obtained from the tar. Thus the coal-tar colors, saccharin, etc., are not contained in coal-tar, but are made by rather complicated methods from benzene and toluene. IRA REMSEN.

Coal-tar Colors: dyestuffs made from the hydrocarbons prepared from coal-tar. Prominent among these are the ANILINE COLORS (*q. v.*), the AZO-COLORS (*q. v.*), the colors from BENZIDINE (*q. v.*), etc.

Coalville: capital of Summit co., Utah (for location of county, see map of Utah, ref. 3–M). It is the southern terminus of a branch railroad, 5 miles long, from Echo City on the Union Pacific R. R., and has beds of valuable Cretaceous coal. Pop. (1880) 911; (1890) 1,166; (1900) 808.

Coan, TITUS: missionary; b. in Killingworth, Conn., Feb. 1, 1801; son of Gaylord Coan and Tamze Nettleton, an aunt of the evangelist Nettleton. Under the preaching of Finney he decided to become a missionary, and in June, 1831, he entered Auburn Seminary, graduating in 1833. Aug. 16, 1833, to May 7, 1834, he was absent with one companion, the Rev. Mr. Arms, on a perilous exploring tour in Patagonia. He married Miss Fidelia Church, of Churchville, N. Y., Nov. 3, 1834, and sailed for the Hawaiian islands Dec. 5, viâ Cape Horn, arriving at Honolulu, June 6, 1835. He occupied the Hilo station for forty-seven years, and his labors were among the most successful in the history of missions, 14,000 of the natives having been gathered into the churches of Hilo and Puna under his pastoral care. The great volcano of Kilauea was in his parish, and he became its constant observer and historian, contributing to the *American Journal of Science* and the *Missionary Herald* scores of papers upon the phenomena of volcanic action in Hawaii. His published books are *Adventures in Patagonia* (New York, 1880) and *Life in Hawaii* (New York, 1881). He was greatly aided in his work by the devotion and the loving energy of his wife, who died in Hilo, Sept. 29, 1872. D. in Hilo, Dec. 1, 1882.

Coan, TITUS MUNSON, M. D.: son of Titus Coan and Fidelia Church; b. in Hilo, Hawaiian islands, Sept. 27, 1836; educated at the Royal School and Punahou School, in Honolulu, at Yale College, at Williams College, and at the College of Physicians and Surgeons, New York, where he graduated in 1861. After serving two years in the civil and military hospitals, he entered the U. S. navy as assistant surgeon Oct. 27, 1863, serving for the most part in the West Gulf squadron, and was honorably discharged Dec. 26, 1865. Dr. Coan has contributed essays and verse to the leading magazines of the U. S., and has written on climate and mineral waters. Author of *Ounces of Prevention* (New York, 1885); of the *Pronouncing Gazetteer* in *Webster's International Dictionary*; and editor of *Topics of the Time* (6 vols., New York, 1883). His home is in New York city, where in 1880 he founded the New York Bureau of Literary Revision for authors and publishers.

Coast: the margin of a land-area, limited by the ocean or its gulfs or bays. The character of a coast-line depends chiefly on two things: 1. Geological change of level, by which the sea is placed on the slope of the land-mass; if by elevation of a smooth sea-bottom the coast-line is of simple form; if by depression of a land-area the coast-line is irregular, the more so the more varied the relief of the submerged land. 2. The time during which the sea has stood at a given level, allowing its waves to cut back headlands into cliffs and form beaches and bars, and permitting rivers to build out deltas, thus simplifying the coast-line from its first irregularity. A flat sea-bottom, as the uplifted littoral plain of Southwestern France, forms a straight coast-line. The coast-line of Texas is almost as simple, with the addition of long sand-bars built off shore by the waves and inclosing linear lagoons. The Carolina coast is of somewhat greater irregularity, the result of gentle submergence of coastal lowlands after rivers had cut shallow valleys, thus producing sounds, as Albemarle and Pamlico, inclosed by extensive off-shore bars, locally called banks, sweeping in long current-made curves concave to the ocean, and joining in pointed capes, as Hatteras, Lookout, and Fear, with sandy shoals drifting out to sea. Norway is an example of extreme irregularity of coast-line, produced by strong submergence of a deeply dissected mountainous region; its deep inlets are called FIORDS (*q. v.*). Many broken coast-lines have risen somewhat since their depression, but

only enough to reveal sea deposits in local coastal plains, without entirely overcoming the effects of earlier and greater submergence. The Maine coast is thus of composite character, its low sandy plains alternating with rocky headlands and long bays; the partial emergence of its submerged land contrasts with the coast of the Carolinas, where there is a partial submergence of an emerged and somewhat dissected sea-bottom. The diversity of a coast-line has much influence in determining the development of maritime pursuits, by affording shelter from heavy waves, and by tempting exploration of outlying islands. Europe is remarkable among the greater land divisions for the diversity of its coast-line, the result of the comparatively small scale of its geological construction, as well as of marginal submergence. Its influence over the rest of the world may be in no small part ascribed to the numerous harbors on its broken coast. The coast-line of Europe is nearly 20,000 miles to an area of 3,816,400 sq. miles; of Africa, 15,000 to 11,600,000; of Asia, 30,000 to 17,310,000. The Atlantic coast-line of the U. S. is 23,000 miles long; that of the Pacific coast, exclusive of Alaska, 15,500 miles. See Beach, Cliff, Delta, Dune, Estuary, Fiords, Harbor, and Islands. W. M. Davis.

Coastal Plain: one of the physiographic provinces of North America, comprising a system of lowlands bordering the Atlantic Ocean and the Gulf of Mexico from New York Bay to the state of Vera Cruz in Mexico. It is in general from 50 to 200 miles broad, but extends northward in the valley of the Mississippi as far as the mouth of the Ohio. Topographically it consists of a plain or a series of plains, interrupted at the north by a great system of estuaries, and everywhere more or less dissected by stream-valleys. Geologically it includes Cretaceous, Eocene, Neocene, and Pleistocene formations, which retain approximately the position acquired during deposition, except that they have been bodily uplifted above the ocean. On the landward side these formations rest upon and against older formations, which have suffered serious disturbance and been greatly eroded. In the Atlantic district a cataract is usually found in each stream just where it passes from the older formations to those of the coastal plain. A line connecting these cataracts, known as the *Fall Line*, indicates approximately the western boundary of the coastal plain. G. K. G.

Coast Castle, Cape: See Cape Coast Castle.

Coast and Geodetic Survey: a bureau of the Treasury Department of the U. S. Government, whose principal office is in Washington, and whose field operations are co-extensive with the territory of the U. S., including Alaska, together with that portion of the ocean which is under the jurisdiction of the U. S. or of which an accurate knowledge is essential to the interests of commerce, as the Gulf Stream and such parts of the Atlantic Ocean and Gulf of Mexico as are closely related thereto.

The Coast and Geodetic Survey is the oldest of the scientific bureaus of the Government. It may be most conveniently treated under three heads: (1) History, (2) Organization, (3) Operations.

History.—To all nations whose territory touches the sea or other water navigable to any extent, or who have any interests in the commerce of the sea, a complete knowledge of the coast, of its nature and form, of the character of the sea-bottom near it, of the location of reefs, shoals, and other dangers to navigation, of the direction and strength of currents, and of the character and amount of magnetic disturbance, is of the greatest moment. To supply this knowledge the governments of all maritime nations have executed in modern times surveys of their coasts by the most exact methods, publishing elaborate and accurate charts for the guidance of the navigator, on which are indicated the location of lighthouses, buoys, and other aids to navigation, together with currents, tides, and compass directions.

About the year 1800 the only charts of the U. S. coasts and harbors were those prepared during the latter half of the preceding century under the direction of the British Admiralty. These were in the nature of a preliminary reconnoissance, and were inadequate to the demands of the increasing commerce of a rapidly growing nation. The demand for a thorough survey of a high character was felt very early, and its importance was urged by Thomas Jefferson. On his recommendation while President of the U. S., Congress in 1807 passed an act authorizing him to inaugurate such a survey, and declaring that it should include a designation of the islands, shoals, and places of anchorage within 20 leagues of the shores, and such other matter as might be deemed proper for completing an accurate chart of every part of the coast; it also authorized the survey of St. George's bank, and the soundings and currents beyond the limits aforesaid to the Gulf Stream.

The execution of this work was assigned to Ferdinand R. Hassler (*q. v.*) a native of Switzerland, who, by his previous experience in Europe and the high character of his attainments, was admirably fitted for the difficult task. His first step was to proceed to Europe for the purpose of obtaining the instruments necessary for the operations of the survey. His standard of excellence was high, and he was content with nothing short of the best appliances for his work, which at that time could not be procured in this country. The instruments had to be specially constructed, and there was naturally much delay incident to the new enterprise; so much, in fact, that the work was entirely arrested by the war with Great Britain in 1812, and it was only in 1817 that sufficient progress had been made to justify a commencement in the important harbor of New York. It had scarcely begun when it was again suspended on account of failure on the part of Congress to provide the necessary funds for its support.

It was not until 1832 that Congress, urged by the Secretary of the Navy and others, made an appropriation for carrying out the plan of 1807, placing the work again under the direction of Mr. Hassler. This was the real beginning of the continuous operations of the Coast and Geodetic Survey. Mr. Hassler was authorized to employ astronomers and such other experts as he deemed necessary, and officers of the army and navy were detailed as assistants. He continued to direct the work until his death in 1843.

The connection of Mr. Hassler with the survey, and especially at its inception, was a matter of great importance to its welfare. He may be said to have "set the pace" for its work. He had been highly educated in a school of precision, and he knew the importance of the sixth decimal place. He was the first to introduce accurate standards of length and mass, and to him was assigned the construction and adjustment of the Government standards of weights and measures. During his superintendency a good beginning of the great work which he had planned was made. A base line was measured in the vicinity of New York, the triangulation was extended thence eastward as far as Rhode Island and south to the head of Chesapeake Bay. A "primary" triangulation had been begun, the topography and hydrography had kept pace with the triangulation, and many charts had been issued.

The work did not go on, however, without meeting obstacles such as had more than once confronted it during its sixty years of continued activity. People who were unaccustomed to operations of precision protested against the unnecessary refinement of the work of the survey, and declared that its results did not justify the expenditure necessary to maintain it. Clamors against the administration of the survey arose, and finally a severe and unfriendly investigation of the service was made by a congressional committee. The result of this was a complete indorsement of the principles on which the survey had been conducted by Mr. Hassler. At the same time a plan was developed for a more comprehensive organization of the service, which shortly brought it into the form in which essentially it exists at the present time.

It was fortunate for the survey that Mr. Hassler's successor was Prof. Alexander Dallas Bache (*q. v.*). Under his administration the work was rapidly expanded, the Pacific coast was taken into the scheme, and the general system of triangulation extended and enlarged. His leadership covered the period of the civil war, during which the regular work of the survey was practically suspended. It was then discovered that the accumulated knowledge of the service, including not only that in the archives in the form of maps, charts, etc., but as well that of the officers of the survey, was of incalculable value in conducting the operations of the army and navy. Many civilian members of the corps were detailed to the various fleets on account of their special knowledge of the coast, and served so well as to receive special recognition at the hands of general officers. Others joined the armies at different points to aid in making reconnoissances, surveys, etc. Officers who had been detailed from the army and navy for service in the bureau at once joined their respective corps. There had been accumulated in the archives a collection of all maps issued of any part of the country, and by means of these the superintendent was able to compile and publish maps of the

Southern States which were of great value in guiding the movements of the Union troops.

At the close of the war the regular operations were resumed on an enlarged scale, demanded by the increased commercial activity of the country. Prof. Bache died in 1867 after a lingering illness, and was succeeded by Prof. BENJAMIN PIERCE (*q. v.*), who served until 1874. During his administration the scheme of transcontinental triangulation was developed and inaugurated.

He was succeeded by Mr. CARLILE POLLOCK PATTERSON (*q. v.*), who had been connected for many years with the survey as hydrographic inspector. Mr. Patterson served until his death in 1881, and Prof. JULIUS E. HILGARD (*q. v.*) was appointed as his successor. Prof. Hilgard had been an assistant in the survey for many years, having been in charge of the office in Washington during the long incapacitating illness of Prof. Bache. During his long service his professional papers, published mostly as appendices to his *Annual Reports*, were numerous and varied. He represented his Government in the International Bureau of Weights and Measures at Paris, serving upon its executive committee. He resigned in 1885, and was succeeded by FRANK M. THORN (*q. v.*), who assumed the superintendency of the survey under peculiar circumstances. Shortly after the beginning of the administration of President Cleveland charges were made involving the integrity of the management and of some of the principal officers of the survey. Pending their investigation, a task which had been assigned to Mr. Thorn by the President, he was directed to assume charge of the bureau, and to perform the duties of superintendent. He continued to discharge these duties until July 1, 1889. Without possessing any special technical or scientific knowledge he made a careful investigation of the business operations of the service, and introduced methods of importance, as affording protection to those charged with the expenditure of money against charges of irregularity or corruption.

While finding that in a few cases the business of the survey had been loosely conducted, he discovered that most of the charges were either entirely unfounded or based on technical grounds, and that, except in rare instances, the work of the service had been honestly done. The later directors were Dr. Thomas Corwin Mendenhall, 1889–94; William W. Duffield, 1894–97; Henry S. Pritchett, 1897–1900; and Otto H. Tittman, 1900–.

Organization.—The plan upon which the Coast and Geodetic Survey is organized is the outgrowth of trial and experience during the first fifty years of its existence. Almost every year has seen some new feature added or some old one discarded.

There are two great divisions of its work: the field and the office.

Field work includes the operations of the survey on land and at sea. Work upon the land is directly conducted by what has been called the "normal force" of the survey, a body of civilian experts permanently attached to it, numbering between fifty and sixty. They are of three grades, namely, assistants, sub-assistants, and aids. The hydrographic work is in general conducted by naval officers temporarily detailed to the survey, and commanding men especially enlisted for the service from the navy. Their connection with it usually lasts about three years, during which time they receive the title of assistants. The service owns a fleet of about fifteen vessels, eight of which are steamers. Special hydrographic work is sometimes executed by members of the civilian staff. All field officers, civilian or naval, receive their instructions directly from the superintendent. For convenience of administration, however, the naval assistants are under the immediate direction of the hydrographic inspector, who is held responsible for all details in the organization of naval parties and for the proper execution of the work assigned them.

The office is that part of the establishment which receives the records, original sheets, etc., representing the results of the field work. They are registered and deposited in the archives, until in turn they are taken up for examination, computation, and adjustment, and finally published. Original charts are reduced or enlarged, engraved, electrotyped, and printed.

The divisions of the office are as follows: Computing, tidal, drawing, engraving, chart, miscellaneous, instrument, archives, and library.

Each division is directed by a chief, who is usually an assistant (field officer) temporarily detailed to this duty. The whole is under the charge of an officer known as the "assistant in charge of the office."

Most of the hydrographic material when received goes at first to the office of the hydrographic inspector. In this office there are the hydrographic division and the coast pilot division, the chiefs of which are usually naval officers.

In addition to the above there is an accounting division with a disbursing agent, and the required force of clerks, writers, draughtsmen, computers, engravers, instrument-makers, printers, etc., numbering in all about 125 at the office in Washington.

There are sub-offices at San Francisco and Philadelphia under the immediate charge of assistants.

Operations of the Field.—All the field operations of the survey being geodetic, a system of primary triangulation, together with the determination of geographical position by means of astronomical methods, must furnish the foundation upon which the whole rests. Such a system was begun under Mr. Hassler shortly after the creation of the bureau. On the Atlantic coast a chain of triangles beginning at Bangor, Me., extends southward to the Gulf of Mexico, constituting an oblique arc which, besides serving as a basis for the coast triangulation, will, when entirely completed and discussed, add much to our knowledge of the figure of the earth. There is another extensive system of triangles extending across the continent along the thirty-ninth parallel of latitude. Short gaps still occur in it in the States of Kansas and Colorado. The parts of this transcontinental system extending E. from the Mississippi river and W. from the Atlantic coast were joined in the year 1890 in Southern Indiana, the junction being very satisfactory. A check base was measured near the points of junction at Holton, Ind., in the year 1891, the length of which was about 5,500 meters. This measurement was taken advantage of for the purpose of testing and studying several methods of base measurement, in order to determine the practice of the survey in the future. To this end extraordinary precautions were taken to ascertain the true length of the line by the most perfect method that could be devised. The principal method for accomplishing this was the use of a 5-meter steel bar imbedded in ice as a unit, this being the first time in the history of work of this character in which the errors arising from temperature were thus eliminated.

Considerable extensions of the principal systems of primary triangulation referred to above have been made in the New England States, New York, and in several of the Western States, including California, where some exceptionally large figures were introduced. The longest lines observed are in California, Nevada, Utah, and Colorado, that from Mt. Helena to Mt. Shasta, over 190 miles in length, excelling all others.

A tertiary triangulation for topographic and hydrographic purposes has been completed along the entire Atlantic and Gulf coasts, and over more than half of the Pacific coast, except Alaska. Much progress has been made in the survey of the coast of the latter Territory, by methods which, while they are more in the nature of a reconnoissance than anything else, possess a sufficient degree of accuracy for immediate use, and are capable of rapid execution. The principal work thus far has been in Southeast Alaska, where it has been generally conducted by naval assistants, the steamer Patterson having been almost exclusively devoted to this field since the year 1885.

In the determination of astronomical positions the service has maintained the accuracy which it was first to inaugurate. In latitude the use of the zenith telescope and in longitude the use of the telegraph have been constantly improved and perfected, so as to leave little to be desired in the way of precision. The survey in co-operation with the International Geodetic Association has maintained continuous observations for latitude at Rockville, Md. (near Washington), San Francisco, Cal., and during 1891–92 at Honolulu, for the purpose of settling, if possible, the vexed question of the supposed periodic change in the position of the earth's axis, relative to a point on its surface. It was also engaged some years since in the determination of longitude in reference to European stations by means of the telegraph, making use of the first successful Atlantic cable for the first comparison.

The topographic operations of the survey have been mostly restricted to a narrow margin, not often over 3 to 5 miles wide, along the coast and surrounding harbors, bays, rivers, up to the head of tide water, and other loca-

tions where hydrographic surveys have been made. In some cases it has been more extensive, and in the District of Columbia a survey was executed by order of Congress in which the scale was $\frac{1}{1200}$, and contour-lines were developed separated by only 5 feet. The plane table was very early adopted by the topographers of the service, and their work has always been distinguished for accuracy of representation.

The hydrographic operations of the survey have extended as far out from the coast as was necessary for the interests of navigation, and have included all harbors, channels, bays, etc., as far as the work has gone. Deep-sea soundings have been made extensively, especially in and about the Gulf Stream, and two important volumes upon the subject have been published. Some idea of the magnitude of the topographic and hydrographic operations can be formed when it is remembered that the shore line of the U. S., as surveyed, has a length of about 30,000 miles, exclusive of that of Alaska, which is several times longer. Much attention has also been given to the tides, and continuous series of tidal records have been maintained at several important points.

Limited space will not permit more than a brief reference to the extensive operations of the survey in the study of terrestrial magnetism, the fruitful results of which are exhibited in its numerous publications on the subject. In addition to the determination of the magnetic elements at many widely distributed points, and their frequent redetermination for secular variation, it has long maintained a photographic registering magnetic observatory, which is moved from one part of the country to another, remaining a series of years at one point.

The study of the force of gravity as a part of the great geodetic problem has received attention within recent years, and the survey has developed methods and instruments which will lead to a great extension of the work at a less cost than by older processes, but without lowering the standard of accuracy.

A system of precise or geodetic leveling, extending across the continent nearly in the line of the great chain of triangles, and checked by lines extending to the Gulf, the Great Lakes, and in other directions, is in process of execution.

The survey is authorized by act of Congress to furnish, under certain conditions, points to State surveys, which it has done quite extensively by extending its triangulation into the States, or by determining geographical positions, or by extending its line of precise levels. To enable it to do this it is authorized to employ during certain months of the year acting assistants in the States receiving this aid, who are generally professors of engineering or physics in the leading institution of learning.

Throughout its history it has constantly been called upon to determine boundary-lines which have been in dispute. One of its officers is a member of the International Commission for fixing the boundary-line between the U. S. and Mexico. Another is by law a member of the Mississippi River Commission; others are called upon for temporary service on harbor commissions and many other national, State, or municipal boards, for which their special training and experience fit them.

The operations of the office consist in general of the reduction, discussion, and proper preparation of the results of the operations of the field force, and the publication in such a form as to be of the most value to the public. Finished charts from the original field sheets and notes are prepared in the office, including drawing, photography, copperplate engraving, electrotyping, plate-printing, etc., except in the case of such charts as receive preliminary publication by means of photolithography.

An important part of the office is the instrument division, where most of the extremely accurate and delicate instruments used in the survey are constructed, adjusted, and repaired. This division is equipped with a well-stocked professional library.

Publications.—Those of most interest to the mariner are charts, coast-pilots, tide-tables, and notices to mariners. About 500 different charts in all are published. These include the main series of coast charts, mostly on a scale of $\frac{1}{80000}$, numbering about 220. A series on a smaller scale and of a more general character includes about 35, while harbor charts on a very much larger scale, varying according to circumstances, number about 250. These charts require constant revision, and frequent resurveys are necessary on account of the ever-changing character of the sea-bottom, and, in some localities, of the configuration of the coast.

Elaborate *coast-pilots*, or books of sailing directions for the Atlantic and Pacific coasts, are published, and are continually revised that they may be kept correct to date.

Tide-tables containing the predicted tides for all principal and many minor ports are published annually about six months in advance, the predictions being mostly made by a tide-predicting machine invented by the late Prof. William Ferrel during his connection with the survey. An edition of about 10,000 copies of a circular known as *Notices to Mariners* is issued monthly, and circulated gratuitously, containing notes of all changes in bars, soundings, etc.

The *Report of the Coast and Geodetic Survey* is published annually in an edition of about 5,000, copies, by joint resolution of Congress. It contains the report of the superintendent, together with those of the assistant in charge of the office, the hydrographic inspector, and the chiefs of the various divisions. It gives a detailed account of the expenditure of the sums appropriated by Congress for the support of the survey, together with progress sketches showing the condition of the various lines of work on which it is engaged and the various localities in which the field-parties have been employed. It also contains the report of the Office of Weights and Measures, the important operations of which have always been under the charge of the superintendent of the Coast Survey. In addition to these the *Annual Report* contains as appendices an extensive series of special reports upon the various technical and scientific operations of the service. Bulletins are also occasionally issued for the purpose of making public such discoveries or results of the work of the survey as are of immediate importance to the public. T. C. MENDENHALL.

Coastguard: a body of men stationed on the coasts of Great Britain and Ireland, under charge of the Admiralty, for the purpose of preventing smuggling and serving as a defensive force with certain powers of a police. With regard to the coastguard service the coasts of the United Kingdom are divided into eleven districts, each having a chief port, in which there is a guardship. The latter is used as a training vessel for boys preparatory to their entering the naval service. The revenue cruisers and gunboats of the defensive branch are attached to these ships as tenders and obtain their complement of men from them. Each district is in charge of a naval captain. The coastguard service is divided into the several classes of commissioned officers, chief officers of stations, petty officers, and boatmen. They are instructed in gunboat exercise, naval gunnery, flag-signaling, etc. They are liable to be called out for active service in the navy in case of war. Their total number was 4,200 in 1895. This service originally belonged to the customs department and was solely designed to prevent smuggling; it was hence called the preventive service. In 1856 it was transferred to the Admiralty, which was empowered to raise the number of the coastguard by additions at any time, so that the total should not exceed 10,000.

Coasting-trade: the trade carried on by vessels sailing along the coast between different ports of the same country as distinct from oversea and foreign trade. In a looser sense the term is applied to trade between ports of neighboring countries on the same coast. The coasting-trade is governed by special regulations. In the U. S. a a statute, called the Coasting Act, was passed in 1793 for enrolling and licensing ships engaged in the coasting-trade. No foreign vessel can engage in the coasting-trade of the U. S., but since 1854 the coasting-trade of Great Britain is open to vessels sailing under any flag. The coasting-trade of the U. S. is very extensive. Formerly this trade was chiefly carried on by means of schooners and sloops, but of late years its character has much changed. It is restricted to registered vessels carrying the U. S. flag. Since the introduction of screw steamers for this service there is a prospect that they will to a great extent supersede the use of schooners.

Coast Province: same as MARITIME PROVINCE (*q. v.*).

Coast Range, or **Coast Ranges**: a title applied to the mountains adjoining and near the Pacific coast within the U. S. From Cape Flattery nearly to the south line of Oregon they constitute a single range, sometimes called the Olympic, separated from the Cascade Range by a series of fertile valleys. The highest peak reaches over 7,700 feet. The Chehalis, Columbia, Umpqua, and Rogue rivers here cut across from E. to W. Thence to the latitude of Mt.

Shasta in Northern California the Coast Ranges merge with the extremities of the Cascade Range and the Sierra Nevada, and in this region they are traversed by the Klamath river. Thence to Point Concepcion they constitute an important composite chain, with narrow included valleys, and this is everywhere separated from the Sierra Nevada by the great valley of California. Midway the chain is divided by San Francisco Bay, the estuary of the Sacramento river. Near Point Concepcion the range is joined by the terminal spur of the Sierra Nevada, and thence to the Mexican boundary the arrangement of its component mountains is irregular. San Bernardino peak, 100 miles from the Mexican boundary, has an altitude of 11,800 feet. G. K. G.

Coat'bridge: a town of Lanarkshire, Scotland; on the Caledonian Railway; 8 or 9 miles E. of Glasgow (see map of Scotland, ref. 12–G). It has 7 churches, 2 academies, and several banks; also 8 malleable-iron works. It is the center of a mineral district in which are numerous smelting-furnaces, and derives its prosperity from the manufacture of iron. It is a place of rapid growth, due to the expansion of the Gartsherrie iron-works. Pop. (1901) 36,981.

Coatesville: borough; Chester co., Pa. (for location of county, see map of Pennsylvania, ref. 6–I); on the Pa. and the Wilm. and No. R. Rs., and on the Brandywine Creek; 39 miles W. of Philadelphia. It is in the rich and beautiful Chester valley, and has several rolling-mills, very large boiler-works, woolen and paper mills, water-works, electric lights, and gas-works. Pop. (1880) 2,766; (1890) 3,680; (1900) 5,721. EDITOR OF "CHESTER VALLEY UNION."

Coati, kō-a-tee', or **Coati Mondi** [the native Tupi (Brazilian) name]: a plantigrade, carnivorous animal belonging to the raccoon family, *Procyonidæ*. The coatis are rather more than 3 feet in total length, the hair coarse, brownish or reddish gray, according to the species. The body is long, the legs short, the tail long, thickly covered with hair, and usually carried erect. A peculiar feature is the long, sharp, flexible nose, which is turned upward in drinking. Coatis climb with ease, associate in troops, are nocturnal in habits, and live on birds, eggs, insects, and worms. There are two species, the Mexican coati (*Nasua narica*), found from the Isthmus of Panama to Southern Texas, and the Brazilian (*Nasua rufa*), distributed over the greater part of South America from Surinam to Paraguay and the seacoast to the Andes. F. A. LUCAS.

Coaticook, kō-ăt'i-kŏŏk: a town of Stanstead co., Quebec, Canada; between the Vermont boundary and Sherbrooke; on the Coaticook river and Grand Trunk Railway (see map of Quebec, ref. 6–C). It is an enterprising place, with many mills and factories. Pop. 3,086.

Coat-of-Arms: originally the garment worn over his armor by a man of noble birth, and embroidered with the wearer's armorial bearings. Hence, in modern heraldry, an escutcheon with its bearings, as distinguished from the crest, motto, supporters, etc., and also, though less properly, a tabard or official garment of a herald, which is always charged with the arms of the prince who is his sovereign.

Coat-of-Mail: a defensive garment for the body; whether made of CHAIN-MAIL (*q. v.*), or by sewing rings or small plates of metal upon leather or cloth.

Cobalt: a hard white metal of sp. gr. 8·5 to 8·9, with a granular fracture, quite malleable at red heat, attracted by the magnet, and even capable of receiving weak magnetic power when rubbed with a magnet, though arsenic destroys this property. It is unalterable in air and water at ordinary temperatures, though at red heat it decomposes water. The metal was first obtained in an impure state by Brandt in 1733, but the ores had already been used since the middle of the sixteenth century for imparting a blue color to glass. Their use was apparently known to the Greeks and Romans, as some of their pigments have been found to contain cobalt. The name is derived from the German word *Kobold*, an "evil-minded sprite," the miners believing that the presence of ores which were heavy and had a metallic luster, but were, so far as they knew, of no value, containing no copper or silver, was due to his influence.

Ores of cobalt are found in various parts of the world, though they are never very abundant. They are almost invariably associated with nickel compounds, and the metal is generally united with arsenic and sulphur.

The metal is nowhere found native, except in some meteorites, some of which have been found to contain from 0·1 to 1 per cent.

The metal may be reduced from its oxide by heating in a current of hydrogen. If the heat has been too low, the cobalt is pyrophoric, and burns with a red flame when brought in contact with the air. It forms several oxides, of which the most important are the protoxide, CoO, and the sesquioxide, Co_2O_3, both of which give a series of salts.

Cobalt salts are prepared by extracting the roasted ore with an acid, precipitating out the arsenic by means of sulphuretted hydrogen or by an iron salt, and then precipitating out the cobalt by means of chlorine water, which converts it into sesquioxide, or by the use of nitrate of potassa, filtering, and dissolving. The chloride is used as a sympathetic ink. The writing, which is an extremely pale pink color, almost invisible, becomes blue when the water of hydration is removed by heat; but it gradually absorbs water and disappears again. The presence of nickel salts gives a greenish cast to the lines. In the arts the compounds of cobalt are applied for coloring either as pigments or enamels. The principal preparation is *smalt*, or azure blue, which is a double silicate of cobalt and potassium, prepared by fusing the roasted ore with carbonate of potassium and clean white quartz sand. The nickel, arsenic, and other impurities settle to the bottom, forming what is termed by the workmen a "speiss." The glass is poured off into water, then ground, and elutriated. The coarser qualities are called "blue sand," and contain some arsenic. The best quality contains little or no arsenic, and is known as "king's blue." The color is very intense, one part of oxide of cobalt being sufficient to give a decided color to 250 parts of glass.

Zaffre, zaffer, or safflor is the roasted ore mixed with twice its weight of quartz sand. It is used for coloring glass, enamels, and pottery glaze. The well-known willow-pattern plates are colored by this substance. *Thénard's blue*, or cobalt ultramarine, is a pigment obtained by calcining phosphate or arseniate of cobalt with alumina. *Rinman's green*, or cobalt green, consists of the mixed and ignited oxides of zinc and cobalt; it is also used as a pigment. Revised by CHARLES KIRCHHOFF.

Coban, kō-baan', or **Vera Paz**, vā'răă-paaz': a city of Central America; department of Alta Vera Paz, Guatemala; about 90 miles N. of the city of Guatemala (see map of Central America, ref. 3–D). Built on the slopes of a rounded hill, the cathedral occupying the top, its streets, radiating in all directions from the central square, look like rural avenues, the low houses with their gardens being screened behind high, dense hedges. It originated in the sixteenth century as the center of the Dominican mission, and was afterward made the political capital of the province of Vera Paz. The missionary occupation gone and the government moved to Salama, it is now falling into decay. Pop. 6,000.

Cobb, DARIUS: portrait and landscape painter; son of SYLVANUS COBB (*q. v.*); b. in Malden, Mass., Aug. 6, 1834; studied from nature without instruction with his twin-brother, Cyrus Cobb. Both brothers served in the civil war 1861–65. Among his portraits are those of Gov. Andrew, of Massachusetts, and Prof. Agassiz, both at Harvard University. He and his brother furnished the design for the Soldiers' Memorial Monument at Cambridge, Mass. Studio in Boston. WILLIAM A. COFFIN.

Cobb, DAVID: a soldier of the Revolution; b. in Attleboro, Mass., Sept. 14, 1748; graduated at Harvard (1766); practiced medicine for many years in Taunton; was a lieutenant-colonel in the continental army, where he served on Washington's staff; negotiated with Carleton the evacuation of New York; member of Congress as a Federalist from Massachusetts (1793–95); was a judge of common pleas, and courageously enforced the proceedings of his court during Shays's rebellion; was Lieutenant-Governor of Massachusetts in 1809; resided as land agent in Maine (1796–1820); a justice of Hancock co., Me., court of common pleas. D. in Taunton, Mass., Apr. 17, 1830.

Cobb, HOWELL: Democratic politician; b. in Cherry Hill, Jefferson co., Ga., Sept. 7, 1815; graduated at Franklin College, Athens, Ga., in 1834; two years later he became an attorney and entered politics. He was a member of Congress 1843–51, during two terms of which he was Speaker of the House, and again a member 1855–57. In Congress he was an imperious debater, mingling declarations of strong Union sentiment with the advocacy of State-rights and new guarantees for slavery. He became Governor of Georgia in 1851 as the candidate of the Union party, and, after a passionate

campaign, was appointed Secretary of the Treasury by President Buchanan in 1857, when he lowered the credit of the Government by buying its bonds at a premium of 18 per cent. and then borrowing money at 12 per cent. to meet current expenses. He was one of the three Southern cabinet officers who paralyzed the U. S. Government during the secession conspiracy. On Dec. 10 he resigned his portfolio. He was president of the Congress of secessionists which met in Feb., 1861, and framed the Confederate Constitution, but Jefferson Davis's aversion kept him afterward in the background. In the civil war he became a major-general of the Confederate army. Died suddenly in New York city, Oct. 9, 1868.

Cobb, Sylvanus, D. D.: Universalist minister; b. in Norway, Me., in July, 1799; was pastor at Malden and Waltham; the author of a *Commentary on the New Testament* (Boston, 1864) and other works, and editor of a denominational newspaper, *The Christian Freeman*, 1838–58. D. in East Boston, Mass., Oct. 31, 1866.—His son Sylvanus (1823–87), twin-brother of Darius (*q. v.*), was the editor of temperance journals and a contributor of popular tales to weekly papers. He published with a memoir the *Autobiography* of his father (Boston, 1867).

Cobb, Thomas R. R.: general; a brother of Gen. Howell Cobb (*q. v.*); b. in Jefferson co., Ga., Apr. 10, 1823; had a high reputation as a lawyer and author of legal works. He was a member of the Confederate Congress and a general in the army of the Confederate States; killed at the battle of Fredericksburg, Va., Dec. 13, 1862.

Cobbe, Frances Power: a rationalistic writer; b. in Dublin, Ireland, Dec. 4, 1822. In early youth she was much troubled with religious doubts. "As she was one day musing on the great problem of existence, she said to herself that although she knew nothing of God or of any law beyond her own soul, she would at least be true to that, and merit the approbation of her own conscience. This resolution, we are told, brought almost immediately a renewed faith in God." She afterward read with great interest the writings of Theodore Parker, whose views on all essential points she appears to have cordially adopted. She became interested in philanthropic work, and was associated for several years with Mary Carpenter in her ragged schools near Bristol; subsequently led a crusade against the practice of vivisection, founding a society in London to restrain it and editing its periodical. Among her numerous works may be named *Intuitive Morals* (London, 1855; 3d ed. 1859); *Broken Lights, an Inquiry into the Present Condition and Future Prospects of Religious Faith* (1864; repr. Boston, 1864; n. ed. 1883); *Dawning Lights* (1868); *Religious Duty* (1857; 2d ed. 1864; repr. Boston, 1865; n. ed. 1883); *Italics: Italy in 1864* (1864); *Hours of Work and Play* (1867); *Alone, to the Alone: Prayers for Theists* (1871; 3d ed. 1881); *Darwinism in Morals, and Other Essays* (1872; repr. Boston, 1883); *Hopes of the Human Race, Hereafter and Here* (1874; repr. New York, 1876); *Re-echoes: Essays* (1876); *False Beasts and True: Essays on Natural and Unnatural History* (1875); *Duties of Women: Lectures* (1880, 3d Engl. ed.; 8th Amer. ed. Boston, 1889); *The Peak in Darien, with Inquiries Touching Soul and Body: an Octave of Essays* (1881; Boston, 1882); *The Scientific Spirit of the Age, and Other Pleas and Discussions* (1888; repr. Boston, 1888); *The Modern Rack: Papers on Vivisection* (1889). She has also edited a complete edition of Parker's works.

Revised by John W. Chadwick.

Cob'bett, William: writer on politics and economies; b. at Farnham, Surrey, England, Mar. 9, 1762. He abandoned the plow, betook himself to London, and became an attorney's serivener; enlisted in the British army, and at Chatham devoured the books of a lending library; served in New Brunswick 1785–91; returned to England and got his discharge in 1792; married and emigrated by way of France in the same year to the U. S.; settled in Philadelphia, where he edited a Federalist paper called *Peter Porcupine's Gazette*, in which he derided the French Revolution and its American sympathizers, and ridiculed the phlebotomy of Dr. Rush in the treatment of yellow fever; was mulet in $8,000 costs and damages for libeling the doctor, and thus was forced to return to England in 1800, and began to issue in London, in 1802, *The Weekly Political Register*, which was at first a Tory paper, but gradually changed and became a strenuous opponent of Pitt and an advocate of radicalism. He was prosecuted for libeling the Government because he denounced the flogging of militiamen by Hessian officers, and sentenced in 1810 to a fine of £1,000 and imprisonment for two years. He continued to publish the *Register* until his death. From 1817 to 1819 he resided on a farm on Long Island, N. Y., to escape prosecution under recent statutes leveled against the independent press. The rest of his life was passed in England and devoted to authorship. Among his popular works were an excellent *English Grammar* (1818); *Rural Rides* (n. ed. 1885); *History of the Reformation* (1827); *Cottage Economy*; and *Advice to Young Men and Women*. He was the originator of the parliamentary reports known as *Hansard's Debates*. In 1832 he was elected a member of Parliament for Oldham. D. near Guildford, June 18, 1835. He was a vigorous writer, and distinguished for his common sense. A selection from his political works, in nine volumes, was published in 1848. See his *Life* (Philadelphia, 1823), and also E. Smith, *Life of Cobbett* (London, 1878).

Revised by H. A. Beers.

Cob'den, Richard: statesman and economist; b. near Midhurst, Sussex, England, June 3, 1804; a son of a poor farmer who lost his freehold in 1814. He was for five years at a miserable school in Yorkshire, then learned mercantile business in the warehouse of his uncle in London, for whom he was a commercial traveler. In 1828 he formed a partnership to sell calico fabrics in London; and three years later the company founded print-works in Manchester, a city with which his name is inseparably linked. Between 1834 and 1838 he traveled in Egypt, Greece, France, and the U. S. In 1837 he offered himself as a candidate for Parliament in the borough of Stockport, but was not elected. He was the most prominent member and orator of the Anti-Corn-law League (*q. v.*) formed in 1839. In 1841 he was returned to Parliament for Stockport. From 1839 to 1846 he was a ceaseless and uncompromising opponent of the duties imposed by the corn laws, and advocate of free trade; and his canvass of the country in behalf of these measures was one of the most memorable in the history of political agitation. After the corn-laws had been repealed in 1846, Sir Robert Peel acknowledged that Mr. Cobden was entitled to more credit for this reform than any other man. In 1847 he was chosen to represent the West Riding of Yorkshire. He was one of the leaders of the Manchester party or school, which advocated electoral reform, a pacific foreign policy, and non-intervention in foreign quarrels. He was defeated in the election of 1857 because he opposed Lord Palmerston's Chinese policy. In 1857 he revisited the U. S., and was elected a member of Parliament for Rochdale. Lord Palmerston in that year offered him a seat in the cabinet as President of the Board of Trade, but he declined it because he disapproved the foreign policy of Palmerston. He negotiated in 1860 a notable commercial treaty with France in the interest of free trade, which expired in ten years, when the Thiers government refused to renew it and France returned to protective tariffs. He was one of the few British statesmen who sympathized with the Union cause in the American civil war. D. in London, Apr. 2, 1865. His influence extended far beyond England, his free-trade principles having found followers and energetic advocates in all civilized lands. His great contribution to free trade was not in originality of speculation, but in putting its doctrines forward as ethical laws and giving his crusade on its behalf a moral character, thus arousing enthusiasm for it. See J. Garnier, *R. Cobden, les Ligueurs et la Ligue* (1846); J. McGilchrist, *Life of Richard Cobden* (1865); *Life*, by John Morley (1881–83); *Political Writings* (1886).

Revised by C. K. Adams.

Co'bet, Carl Gabriel: Dutch philologist; b. in Paris, 1813; Professor of Greek at Leyden for nearly forty years; one of the greatest text critics and palæographists of modern times. His work was chiefly confined to classical and very late Greek writers. Among his publications may be mentioned *Oratio de arte interpretandi* (1847); *Diogenes Laertius* (Didot, Paris, 1840); *Variæ Lectiones* (1873, 2d ed.); *Novæ Lectiones* (1858); *Miscellanea Critica* (1876). Founder and editor of the philological periodical *Mnemosyne*. (See J. J. Hartmann, *Biograph. Jahrbuch*, xii., p. 53–67, 1889.) D. at Leyden, Oct. 26, 1888.

Alfred Gudeman.

Cobija, kō-bee'hăă: a seaport-town of Chili; in the province of Atacama; lat. 22° 34′ S. (see map of South America, ref. 6–C). It was formerly the capital of the Bolivian littoral province of Atacama or Lamar, and the official name was Puerto Lamar, in honor of the first president of Peru.

The place was then important as the principal seaport of Bolivia. Taken by the Chilians in 1879, it has been supplanted by other ports, and is now a mere village. The landing is bad, and the surrounding country is a desert without water. HERBERT H. SMITH.

Cob'leigh, NELSON EBENEZER, D. D., LL. D.: clergyman, educator, and journalist of the Methodist Episcopal Church; b. in Littleton, N. H., Nov. 24, 1814; graduated at the Wesleyan University, Conn., in 1843; joined the New England Conference 1844; was elected professor in McKendree College, Ill., 1853; professor at Lawrence University, Wis., 1854; president of McKendree College 1858; editor of *Zion's Herald* (Boston, Mass.) 1863; president of East Tennessee Wesleyan University, Athens, Tenn., 1867; and editor of the *Methodist Advocate* (Atlanta, Ga.) 1872. He was author of numerous and able reviews. D. at Atlanta, Feb. 1, 1874.

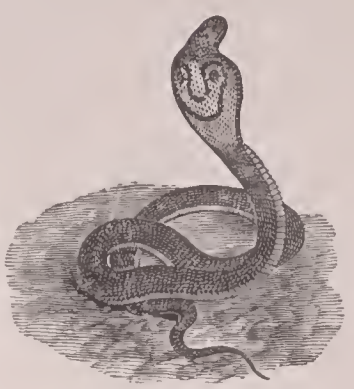
Co'blenz (anc. *Confluentes* or *Confluentia*): fortified city of Rhenish Prussia: finely situated at the confluence (whence its name) of the Rhine and the Moselle; 50 miles S. S. E. of Cologne, with which it is connected by rail (see map of German Empire, ref. 5–C). The Rhine is crossed by a bridge of boats 485 yards long, and the Moselle by a fourteenth-century stone bridge, and both rivers by fine railroad bridges of iron. The old castle of the Electors of Treves, the Church of St. Castor (begun in 1836 A. D.), and the Florins church are the most interesting buildings. The city has a gymnasium, Real-gymnasium, and a normal school for women. Coblenz is a free port, and has an active trade in wine, grain, etc.; also manufactures of cotton and linen fabrics and japanned wares. On the opposite side of the Rhine is the strong fortress of Ehrenbreitstein. Coblenz was the capital of the ephemeral department of the Rhine and Moselle created by the French republic in 1798, but it became Prussian by the treaty of 1815. Pop. (1890) 32,671.

Cob'leskill: village; Schoharie co., N. Y. (for location of county, see map of New York, ref. 5–I); on Del. and Hudson Canal Co. R. R. and on Cobleskill creek; 45 miles W. of Albany. Here are four churches, a high school, agricultural-implement manufactory, sash and blind factory, shirt-factory, building-stone quarries, etc. The village is a center of trade for the surrounding district. Pop. (1880) 1,222; (1890) 1,822; (1900) 2,327. EDITOR OF "TIMES."

Cob-nut: the English name for the nuts of the HAZEL (*q. v.*). It is also applied to certain West Indian fruits, the product of *Omphalea triandra*, a tree of the family *Euphorbiaceæ*. This plant sometimes attains a height (in conservatories) of 12 feet. Its leaves are oblong, oval, or cordate, and are placed alternately upon the stem. The fruit is yellow, globose, furrowed, and about 1½ inches in diameter, and contains three nut-like seeds, whose endosperm is edible after the removal of the poisonous embryo. C. E. B.

Co'bourg: a port of entry and capital of Northumberland co., Ontario, Canada; on Lake Ontario and on the Grand Trunk Railway; 69 miles E. by N. of Toronto, and the south terminus of the Cobourg, Peterborough and Marmora Railway (see map of Ontario, ref. 4–F). It has a good and commodious harbor, and regular lines of steamers to many of the principal lake and river ports of Canada and the U. S. The town is finely laid out, well built, lighted with gas and electricity, and supplied with a system of water-works. Among the finest buildings are Victoria Hall, owned by the town, and Victoria College (Wesleyan Methodist), connected with Victoria University, the Arlington hotel, a summer resort for tourists from the U. S. Cobourg has manufactures of woolen goods, railway-carriages, castings, lumber, beer, etc., and exports lumber, provisions, flour, and iron ore. Pop. (1891) 4,829.

Co'bra de Capel'lo [Portug. hooded snake; *cobra*: Span. *culebra*: O. Fr. *culuevre* < Lat. *co'lubra*, adder; *capello*: Fr. *chapeau*, from deriv. of Lat. *cappa*, head-covering]: a venomous serpent of the genus *Naja*, of the family *Najidæ*. The name is usually limited to *Naja tripudians*, a native of the East Indies, one of the most venomous of known reptiles. Other species of *Naja* are found in the warmer parts of Asia, Africa (*Naja haje*), and the East Indian islands. The term cobra de capello is derived from a singular faculty possessed by these snakes of expanding and elevating the skin of the back of the neck into the resemblance of a hood. This phenomenon is shown when the creature is angry or excited, and is produced by the structure and action of the skeleton, as well as of the skin and muscles. The back of the hood is usually ornamented with two eye-like spots joined by a curved dark stripe, the whole resembling a pair of spectacles; hence it is often called the "spectacle-snake." The color of cobras is not uniform; some are brownish olive, having the spectacles white, edged with black. Another variety has cross-bands of black. Specimens without spectacles have been found in Java, Borneo, and other islands. The cobra attains a length of from 3 to 5 or more feet. It is sluggish in its habits, and easily destroyed. It feeds on lizards and other small animals. Its venom is secreted by two large glands in the head, and is extremely powerful, often causing death in two hours or less. This poison, though generally fatal if introduced through a wound, is said to be harmless when taken into the stomach. The only successful treatment is immediate excision or thorough cauterization of the wound, but Fayrer believes that artificial respiration will save many cases. The cobra, together with other serpents, is an object of worship among many of the Hindus. Thousands of people perish annually in British India from the bite of this and other snakes, and the Government pays a bounty for the destruction of dangerous serpents.



Cobra de capello.

Co'burg (Lat. *Melocabus*): a town of Central Germany; duchy of Saxe-Coburg-Gotha; on the river Itz and on the railway from Dresden to Munich; 26 miles N. of Bamberg (see map of German Empire, ref. 5–E). It is the capital of the duchy of the same name, and contains one of the residences, erected in 1549, of the Duke of Saxe-Coburg-Gotha, and is the seat of all the high courts of the duchy. It has a ducal palace with a large library, a theater, an observatory, an evangelical gymnasium, and a large arsenal. On a hill 500 feet high is an old castle in which Luther was concealed in 1530; used as a prison 1782–1838; then restored and turned into a museum of art and natural history. A palace of the Duke of Edinburgh is here, and a statue of his father, Albert, Prince Consort of Great Britain. Here are manufactures of cotton, linen, and woolen fabrics, etc. Pop. (1895) 18,689.

Co'ca: a drug derived from the leaves of *Erythroxylon coca*, of which there are two distinct species, one in Bolivia and one in Peru. The drug is also cultivated in British India, Java, and Ceylon. It contains an alkaloid known as cocaine, which, when it comes in contact with any one of the mucous membranes, produces local anæsthesia. The leaves closely resemble the ordinary tea-leaf, and are 2 inches or more in length and about 1 inch wide. Coca has been used for many years by the natives of Peru as a nervous or sexual stimulant. From it are now prepared a large number of official preparations, of which the wine of coca and the fluid extract of coca are the ones most commonly employed. In cases where poisoning by coca has taken place there are evidences of great nervous excitement, consisting in mania with delusions and hallucinations, sometimes followed by collapse and excessively high temperatures. Coca belongs to that class of drugs which should always be used cautiously by both physicians and the laity. H. A. H.

Cocaine, kō'ka-in: an alkaloid ($C_{17}H_{24}NO_4$) obtained from the leaves of the *Erythroxylon coca*, a South American shrub. It crystallizes in colorless, odorless prisms, and has a slightly bitter taste. Its salts are soluble in water, and it is generally used in the hydrochlorate. The leaves from which it is obtained are enormously used in South America as a powerful nerve stimulant and intoxicant. In the natives of South America they are said to produce a most agreeable intoxication, with extraordinary emotional exaltation, and a most vivid series of visions. It is doubtful whether the activity of the leaves depends solely upon the cocaine or in part upon a volatile substance which is lost during transportation. Certainly the symptoms produced by cocaine in Europeans are essentially different from those described by travelers as caused by coca.

Cocaine is one of the most powerful drugs introduced into the pharmacopœia in modern times. While known for many years as an alkaloid, its powers as a local anæsthetic were not recognized in medicine until 1884. Since its introduction it has been employed in diseases of the eye and ear, and in

minor surgery generally. It can not penetrate the skin, and therefore is never used to affect nerves protected by that covering, but it paralyzes the peripheral sensory nerves of mucous membrane.

A number of fatal cases of poisoning have been caused by cocaine, many of them following the local use of the drug. The symptoms are extreme weakness, frequency of the pulse and of the respiration, muscular twitchings; in severe cases followed by nausea, vomiting, almost imperceptible, rapid, or slow pulse, great perspiration and collapse. Convulsions are usually present, may come on early, and may be very violent; often they are partial. When cocaine is taken into the system in moderate doses, it acts as a stimulant to the brain and to the spinal cord. It is also a muscle poison. Clinical experience has shown that cocaine is of very little value in the treatment of mental depression, or for the relief of constitutional depression of any kind. It has value as a respiratory stimulant in the treatment of narcotic poisonings, but it is chiefly administered internally in irritability of the stomach, upon which organ it acts locally.

The dose of cocaine is one-fourth of a grain. In the U. S. cocaine has been habitually used in excess as a stimulant by a few persons, but the effects are rarely sufficiently pleasant for the habit to become general. H. C. Wood.

Cocce'ius, Nerva: an eminent Roman jurist; a grandfather of the Emperor Nerva. He was elected consul in 22 A. D. His learning is highly extolled by Tacitus. D. about 33 A. D.

Cocce'jus, Cocceius, Koch, or **Koken**, Johannes: theologian; b. in Bremen, Aug. 9, 1603. He was Professor of Hebrew at Franeker from 1636 to 1650, when he became Professor of Theology at Leyden, where he died Nov. 5, 1669. He wrote commentaries of great learning and ability on nearly the whole of the Old Testament, but is best known as the founder of the so-called "Federal School" in theology. His doctrine of the covenants of works and grace is drawn out in the treatise *Summa Doctrinæ de Fœdere et Testamento Dei* (Leyden, 1648; 2d ed. 1653). His *Hebrew and Chaldaic Lexicon* (1669) was one of the earliest complete Hebrew dictionaries.

Coccejus, Samuel, Baron: statesman; son of Heinrich Coccejus (1644–1719), a civil-law jurist; b. in Heidelberg in 1679: became in 1727 Prussian Minister of State, and in 1746 Chancellor to Frederick the Great. He was the author of a new code of laws (*Codex Fridericianus*, 1747–50). D. in 1755. See Trendelenburg, *Friedrich der Grosse und sein Grosskanzler Samuel von Coccejus* (1863).

Coccol'oba [Gr. κόκκος, berry + λόβος, pod]: genus of evergreen trees of the Buckwheat Family (*q. v.*), natives for the most part of tropical America. Several of the species have been grown in conservatories, viz.: *C. obovata*, a large tree of New Granada, *C. pubescens* and *C. uvifera*, smaller trees of the West Indies and Florida. C. E. B.

Cocco-root: the root of any one of several species of aroids of the family *Araceæ*. These belong to the genera *Colocasia*, *Caladium*, and others, whose starchy root-stalks are collected and, after roasting, used as human food.

Coccos'teus [from Gr. κόκκος, grain, berry + ὀστέον, bone, in allusion to the prominences on its bony armor]: a genus of fossil ganoid fishes found in the Devonian of Europe and Canada. The head has distinct bones, covered by bony plates, and the front part of the body was protected by a shield-shaped dorsal plate, flanked by smaller plates, and by a single plate beneath. The hinder part of the body was unprotected. There was a dorsal and anal fin, but no pectorals. F. A. L.

Coc'culus In'dicus, or **Fishberries** (sometimes called *Indian berries*): berries derived from a climbing shrub of the family *Menispermaceæ*, which is a native of India. They occur as somewhat kidney-shaped masses about as large as a pea, with a dry, black, somewhat wrinkled covering. They possess no odor, but an extremely lasting bitter taste. From them is prepared a tincture which is, however, practically never employed in medicine. Most commonly cocculus indicus berries are used for the purpose of destroying lice in the hair of the head, or elsewhere, but as they contain a very poisonous alkaloid known as picro-toxin it is not safe to employ them in too strong a solution or too large quantity lest they cause convulsions. Particular caution must be employed if the surface to which they are applied is broken. H. A. H.

Coc'cus [from Gr. κόκκος, grain, berry, seed; so called because formerly supposed to be the seed of a plant]: the typical genus of the family *Coccidæ*, a group of bugs (see Hemiptera) including the scale-insects, bark-lice, mealy-bugs, etc. They are the most aberrant of all the bugs, they vary greatly in appearance, and even the two sexes of the same species bear but the slightest resemblance to each other. The male undergoes a complete metamorphosis, has but a single pair of wings, and in the adult stage has no organs for taking food; the female is wingless and has a scale-like or grub-like body, frequently covered with a mealy powder or a wax-like secretion. She inserts her beak in the plant on which she lives and through it sucks her food. As these insects usually occur in large numbers they occasion great injury by destroying the vitality of the plants on which they feed. Various washes of soap or alkali are used in killing them. The cottony cushion-scale (*Icerya purschasi*), which at one time threatened the orange industry of California, has been almost completely exterminated by the Australian ladybug. From bugs of this family are produced the dyes Kermes and Cochineal (*qq. v.*), while to others we owe Lac (*q. v.*) and China wax. J. S. K.

Cochabam'ba: a central department of Bolivia; bounded N. by Beni, E. by Santa Cruz, S. by Chuquisaca and Potosi, and W. by Oruro and La Paz; area, 26,768 sq. miles. It lies to the E. of the highest mountain-chains, but the average elevation is probably 5,000 feet, and it is crossed by many spurs and ridges, some of them lofty. The elevated valleys and plains between these have a delightful, spring-like climate, and are very fertile. There are extensive forests on the mountain-sides, containing cinchona and other valuable trees. Wheat, corn, potatoes, and coca are extensively raised on the open lands, and there are large flocks and herds. The department is said to be rich in gold, but it is not regularly mined. The principal exports are wheat, cheese, wool, and coca, which are carried over mountain-roads to Oruro and La Paz. Pop. (1888) 196,766. Capital, Cochabamba.
Herbert H. Smith.

Cochabamba: a city; capital of province of same name in Bolivia; situated in a fertile plain, surrounded by mountains; 8,400 feet above sea-level (see map of South America, ref. 5–D). A large proportion of the population are Indians, still speaking the Aymará language. Cochabamba was founded in 1465, and has a number of ancient churches and other interesting buildings. Hand-woven cotton and woolen cloths, pottery, and leather work are manufactured in considerable quantities, and the city is a trading-point for all Central Bolivia. It is very healthful, the mean annual temperature being about 63° F. Pop. of city (1888) 19,500; with surrounding villages about 40,000. Herbert H. Smith.

Coche, Island of: See Margarita.

Cochimi: See Yuman Indians.

Co'chin: a feudatory state of Madras, British India; on the Malabar coast; bounded S. W. by the ocean, and on several sides by Travancore and Malabar. Area, 1,361 sq. miles. The climate is very wet. Here are extensive forests of teak and other trees. Rice, pepper, ginger, yams, and sweet potatoes are among the productions of the soil. Pop. 600,000. Chief town, Cochin.

Cochin: a seaport-town; formerly the capital of the state of the same name. It is situated at the entrance of an extensive back-water or lagoon, 80 miles S. S. E. of Calicut (see map of South India, ref. 7–D). The lagoon, which is nearly 120 miles long, and is navigable, affords valuable facilities for communicating with the interior. Cochin has great natural advantages for trade and ship-building. The Jews, of whom there are many both of the white and black castes, have a synagogue, almost the only one in India. Cochin is also a Roman Catholic episcopal see. Here the Portuguese erected in 1503 their first fort in India. They were expelled from Cochin by the Dutch in 1663. The town was ceded to the British in 1814. The chief articles of export are teak-timber, cardamoms, coir, etc. Pop. 15,000.

Cochin-China: a name applied to the eastern part of the Indo-Chinese peninsula. See Annam, Tonquin, and Cochin-China (*French*).

Cochin-China (*French*, or *Lower*): a French colony on the delta of the Mekong river; extending from Cape Camao to about 11° 30′ N., and from lon. 104° E. to 107° 30′ E.; bounded N. by Cambodia, N. E. by Annam, and elsewhere by the Chinese Sea and Gulf of Siam. It is a portion of the former Annamese province of Champa. Area, 23,082 sq. miles. The surface is composed of alluvial deposits, is very flat, and is said to be in places below the level of the sea.

The great number of rivers and the very small slope of this vast plain permit the tide to be felt generally over the territory, causing the river flats to be ultimately covered with water and exposed to the vertical rays of a tropical sun. All the coasts are covered with mangroves, indicating unhealthiness. The mean temperature is high (83° F.), and the greatest heat falls in April and May (97° F.). The humidity is always high, and there is less than the usual difference between the day and night. About one-sixth of the total area is cultivated. The chief crop is rice; cocoanuts, sugar-cane, and tobacco are grown. There are four provinces (Saigon, Mytho, Vinh-Long, and Bassac), and one deputy is sent to the French legislature. The total population in 1900 was estimated at 2,252,034; of these 2,537 were French, 153,000 Cambodians, 56,000 Chinese, 9,600 savages, and some Malays, the remainder being Annamese; 5,800 were Roman Catholics and 1,688,270 Bûddhists. There were 628 schools, with 115 European and 1,183 native teachers, and 25,397 pupils. The colony has 51 miles of railway (from Saigon to Vinh-Long) and 1,840 miles of telegraph line. The annual revenue and expenditure (local) for 1890 balanced at $6,000,000. The expenses of maintaining the colony appear in the French budget annually at about $650,000, and in 1893 required a further sum of $1,000,000 to be raised in Cochin-China for military expenses in Annam and Tonquin.

M. W. H.

Cochineal [viâ Fr. from Span. *cochinilla*, Ital. *coccinìglia*, deriv. of *coccino*, scarlet robe; Lat. *coccum*, berry, the kermes; see Coccus]: the insect which yields the dyestuff carmine. It is native in Mexico, but it is cultivated in several other hot countries, as, for example, West Indies, Teneriffe, Madeira, Algeria, and Java. It lives on a species of cactus, and is the size of a small ladybird. It fastens itself to the plant and remains in contact with it until death. Just before they lay their eggs the insects are particularly rich in the coloring-matter, and they are therefore then gathered. They are killed either by hot water or by steam, and dried in the sun in ovens or on plates. About 70,000 of the insects are required to make a pound of cochineal. When the cochineal is placed in water it swells up, and the form of the insects can then easily be recognized. Several different varieties of cochineal are found in the market, some of them being adulterated with barium sulphate and other substances. The value of a given specimen can be approximately estimated by dissolving a certain weight of it in a certain volume of water and comparing the color of the solution thus obtained with that of a solution of a standard specimen prepared in the same way. It has been shown that the best specimens of cochineal contain only about 10 per cent. of the coloring-matter. It was at one time stated that this coloring-matter is a Glucoside (*q. v.*), but the latest investigation of this subject by Liebermann has furnished no evidence in favor of this view. When cochineal is extracted with benzene and the benzene evaporated, a waxy substance is obtained which is called *coccerin*. This is accompanied by some *myristin*. From the former by saponification two substances are obtained—*cocceric acid*, $C_{31}H_{62}O_3$, and *cocceryl alcohol*, $C_{30}H_{30}(OH)_2$. Myristin when saponified yields myristic acid, $C_{14}H_{28}O_2$, and glycerin, and is therefore similar to the common Fats (*q. v.*). Cochineal colors were formerly used for dyeing wool or silk crimson or scarlet. The colors are, however, not very permanent, though brilliant and attractive. Carmine is prepared by treating a solution of cochineal with cream of tartar, alum, or acid oxalate of potassium. When a solution of cochineal is treated with an alkaline carbonate and alum, a compound known as carmine-lake is obtained.

Ira Remsen.

Cochituate Lake: in Middlesex co., Mass.; 18 miles W. from Boston; 3½ miles long, about 1,800 feet wide in its broadest part, and has an area of 800 acres at high-water mark. Dug Pond (44½ acres) and Dudley Pond (81 acres) are tributary to it. The lake is connected by an artificial channel with Sudbury river, and is the principal source of water-supply for the city of Boston.

Coch'ran, John, M. D.: b. in Sudsbury, Chester co., Pa., Sept. 1, 1730; studied medicine with Dr. Thompson, of Lancaster; served as surgeon's mate in the hospital department in the French war of 1755; at the end of the war he settled in Albany, N. Y.; removed soon after to New Brunswick, N. J.; Apr. 10, 1777, he was appointed on Washington's recommendation physician and surgeon-general in the middle department; in Oct., 1781, he was made director-general of the hospitals of the U. S. After peace was declared he removed to New York, and was made commissioner of loans by Washington. D. at Palatine, Montgomery co., N. Y., Apr. 6, 1807.

Cochran, John: general; b. at Palatine, Montgomery co., N. Y., Aug. 27, 1813; grandson of Dr. John Cochran (*q. v.*); graduated at Hamilton College, Clinton, N. Y., in 1831; became a lawyer and removed to New York city in 1846; was surveyor of the port of New York for four years; Democratic member of Congress (1856–62); appointed brigadier-general of volunteers in 1862; assigned a brigade in Couch's division of the Potomac army; led the reserve in the battle of Antietam; took part afterward in the pursuit of the retreating enemy; resigned from the army in 1863 on account of ill-health; in 1864 was nominated for Vice-President on the Fremont ticket. He was attorney-general of New York in 1865, and a delegate to the Philadelphia National Union convention of 1866, and to another of the same name in Chicago in 1868. He was appointed revenue collector for the sixth district of New York in 1869; supported Horace Greeley for President in 1872; served in the city council of New York, and was acting mayor when Oakey Hall temporarily retired on account of the Tweed fraud investigations; in 1883 again became a member of the council. D. in New York, Feb. 7, 1898.

Cochrane, John Dundas, Captain: a British naval officer; son of Admiral Sir Alexander Cochrane (1758–1832), who fought in Chesapeake Bay during the Revolutionary war and commanded the British fleet in the war with the U. S. of 1812–15; was called the "pedestrian traveler"; b. about 1780. He purposed a journey round the globe on foot, and traversed Russia and Siberia in that manner. When he arrived in Kamtchatka, however, he married and abandoned his original project. He returned by way of Russia to England in 1823, and published a narrative of his travels the next year. Died in South America, Aug. 12, 1825, having gone thither to engage in mining speculations.

Cochrane, Thomas, Tenth Earl of Dundonald: a British naval officer; b. at Annsfield, Lanarkshire, Scotland, Dec. 14, 1775. He joined the navy in 1793, became lieutenant in 1796, and made a brilliant record in the Mediterranean. Commissioned in 1809 to take fire and explosive ships against a French fleet in Aix Roads, he made the attack Apr. 11, drove most of the enemy's ships ashore, and four were destroyed; but Cochrane claimed that he had not been properly supported, and the official quarrels which followed ruined his naval prospects. Elected to the House of Commons, he devoted himself to exposing abuses in the navy, a course which made him many bitter enemies. In Feb., 1814, he was accused of complicity in a fraudulent affair connected with the Stock Exchange. He always claimed to have been perfectly innocent of this, but he was found guilty, imprisoned for a year, fined, expelled from Parliament and the navy and from the number of Knights of the Bath, an order which he had received for his Mediterranean services. Cochrane's constituents immediately returned him again to Parliament, and after his release he was a virulent opposer of the Government. In 1817 he accepted an invitation from the Chilian Government to organize and command its navy. He reached Valparaiso with several English officers Nov. 28, 1818. To oppose the powerful squadron of the Spaniards he found only seven vessels, one a frigate that had been captured and the rest condemned English ships or old merchantmen. Yet with these he destroyed Spanish commerce on the Pacific coast of South America, blockaded the enemy's ships under shelter of their forts, and opened the way for the land forces to act against Peru. In Jan., 1820, by a brilliant series of actions, he took Valdivia, Chili, with the garrison and a large amount of stores. In Aug., 1820, he conveyed San Martin's army to Peru, and he subsequently made independent movements which largely contributed to the capture of Lima and Callao. His feat of cutting out the Esmeralda frigate from under the guns of Callao castle (Nov. 5, 1820) was one of the most brilliant in naval history. But Cochrane's faculty for quarreling impaired his usefulness. He was unable to agree with the dictator, San Martin, and after he had seized a treasure at Ancon to pay his sailors, he was summarily ordered to leave Peruvian waters. Shortly after he quarreled with the authorities in Chili, and finally left the service in Jan., 1823. In March following he was appointed first admiral of the Brazilian navy. He immediately sailed for Bahia, forced the Portuguese to evacuate that city (July 2, 1823), pursued their fleet, and took several vessels. Passing

to Maranhão, he reduced that place, remaining there until 1825, when without leave he made a cruise to England. He claimed that the health of the crew required this, but he was accused of desertion and ordered home, whereat he resigned. In 1827 and 1828 he had charge of the Greek navy, but accomplished nothing. He obtained in 1832 a "free pardon" for the offense for which he had been convicted in 1814, was restored to the order of the Bath and to his naval rank, becoming rear-admiral by seniority in 1854. His father's death in 1831 had left him a peer of England. Much of his later life was devoted to mechanical invention, and he claimed to have perfected a system for the destruction of a fleet or fortress at a blow. He wrote *Narrative of Services in the Liberation of Chili, Peru, and Brazil*, and *Reminiscences of a Seaman*. D. at Kensington, Oct. 31, 1860.

HERBERT H. SMITH.

Cochrane, Rev. WILLIAM: See the Appendix.

Cocinic Acid: a volatile acid found in the butter or oil of the cocoanut.

Cock: in its common and restricted sense the male of the domestic fowl; in a wider sense used for the male of various birds. While domesticated in the East at an early date, since it is figured on Babylonian cylinders six or seven hundred years before the Christian era, the cock does not appear on Egyptian monuments, nor is it mentioned in the Old Testament, nor by Homer. The first reference to the bird in Greek literature occurs in the works of Theognis, somewhere about 600 B. C., where it is spoken of as "the awakening cock of dawn." The cock has figured largely in literature and art, being sacred to Mars, on account, perhaps, of his having been at an early date the god of agriculture. In allusion to St. Peter it is frequently introduced into paintings of the passion of our Lord, and it is the emblem of St. Peter. Among the early Christians the cock was symbolical of vigilance, and it was carved on tombs as an emblem of the resurrection, metaphorically signifying the coming of light after the night of death, or announcing the general awakening of the resurrection. See also FOWL. F. A. L.

Cockade: a badge, usually in the form of a knot or rosette, worn on the hat or cap by officers of the army or navy; also at times by citizens as a party distinction. The Bourbon cockade in France was white, that of Spain red. During the Revolution of 1789 the French people generally assumed the tricolored ribbon (red, white, and blue) as a badge of patriotism or the symbol of the new *régime*. The army also wore the tricolored cockade until the Restoration, when the legitimists resumed the white color. It became also in the U. S. a badge of the Jeffersonian Republicans until war seemed impending with France in 1798. In Great Britain a white rose was the badge of the Stuarts, and became a favorite theme in Jacobite songs after the Stuarts had ceased to reign; the yellow cockade was introduced into Great Britain with William of Orange, and the black with the house of Hanover, and was a mark of both civil and military rank. Thence it passed into use as a part of the livery of coachmen and other servants.

Cockatoo [a word derived from the cry of these birds]: a common name for the members of the family *Cacatuidæ*, a group of large parrots inhabiting Australia, New Guinea, the Philippines, and some of the adjacent islands. They are distinguished by conspicuous crests, large bills, moderate wings, and large, slightly rounded tails. They usually associate in large flocks, breed in hollow trees or crevices in the rocks, and feed on fruit, seeds, and the larvæ of insects. Their cry is harsh, and as a rule they do not readily learn to pronounce words. The sulphur-crested cockatoo, so frequently seen in menageries, is the best-known species. It is a native of Australia, and in some localities does great damage to growing crops, being in consequence shot without mercy by farmers. Leadbeater's cockatoo (*Cacatua leadbeateri*), an allied species also from Australia, is white, tinted with rose color, which deepens to salmon under the wings. The base of the crest is crimson; but this, like the yellow of the preceding bird, does not show unless the crest is open. The great black cockatoo, *Microglossum aterrimum*, found in New Guinea, is the largest of the parrots. It is distinguished by its enormous bill, bare, red cheeks, glossy black plumage, and long cylindrical tongue which is tipped with a horny point.

The raven cockatoos, of the genus *Calyptorhynchus*, have longer tails and smaller crests and beaks than those previously described, and also differ from them in not assembling in large flocks. The general color of their plumage is black or dark brown, and the tail usually has a band of red or yellow. They are residents of Australia and Van Dieman's Land, and, with other species, formerly played an important part as an article of food among the natives, who killed great numbers with the kiley, or boomerang. Like the Carolina parrakeet, they hover about a dead or wounded comrade, and several may be killed in quick succession before the rest take the alarm and leave the spot. F. A. LUCAS.

Sulphur-crested cockatoo.

Black cockatoo.

Cockatrice: a fabulous monster or venomous serpent, which has been sometimes identified with the BASILISK (*q. v.*). It was said to be hatched from the cock's egg, and its breath and look were fatally poisonous. The word occurs in the

English version of the Old Testament as the name of a venomous serpent.

Cockburn, kō′bŭrn, Sir Alexander James Edmund, Bart.: jurist; b. Dec. 24, 1802; graduated LL. B. at Trinity Hall, Cambridge, in 1829; was called to the bar, and subsequently became Q. C. in 1841. He made a large fortune as a promoter of railway legislation during the speculative times of 1846; was elected to Parliament as a Liberal in 1847; defended Palmerston's headstrong foreign policy of 1850 in a memorable speech in the House of Commons; was appointed attorney-general in 1851. In 1856 he became chief justice of the court of common pleas, and in June, 1859, lord chief justice of the court of queen's bench; presided in the Tichborne case; succeeded to the baronetcy of his uncle, the Dean of York, in 1858. He was selected by the British ministers as an arbitrator in the tribunal for the settlement of the "Alabama claims" at Geneva, in 1871–72. D. Nov. 20, 1880.

Cockburn, Sir George, G. C. B.: British admiral; b. in London, Apr. 22, 1772; entered the navy in 1781; lieutenant 1793; captain of a frigate in 1794; rear-admiral in 1812; assisted in the capture of Washington, D. C., in Aug., 1814; conveyed Napoleon Bonaparte to St. Helena 1815; Lord of the Admiralty 1818 and 1828; member of Parliament for many years. D. at Leamington, England, Aug. 19, 1853.

Cockburn, George Ralph Richardson: Canadian educator; b. in Edinburgh, Scotland, Feb. 15, 1834, and graduated at Edinburgh University in 1857. He moved to Canada in 1858; the same year became rector of the Model Grammar School for Upper Canada; in 1861 was appointed principal of Upper Canada College, an office which he held for twenty years. He entered the Dominion Parliament in 1887, and was re-elected in 1891. He was a member of the University of Toronto for twenty years.

Neil Macdonald.

Cockburn, Henry Thomas, Lord: Scotch judge and author; b. Oct. 26, 1779; called to the bar in 1800; solicitor-general for Scotland 1830; became one of the lords of session 1834. He wrote for the *Edinburgh Review*, and published the *Life and Correspondence of Jeffrey* (1852), and *Memorials of his Time* (1856), the latter of an autobiographical character. D. Apr. 26, 1854.

Cockchafer: a common English name for the May-beetle (*Melolonthus vulgaris*) of Europe, represented in America by the June-bugs, of which there are more than sixty species, belonging to another genus (*Lachnosterna*). These, both as larvæ and adults, are to be regarded as pests. The adults eat the leaves of trees, sometimes completely defoliating them, but as their life in the adult state is but a few days they do comparatively little damage. The larvæ, known as "white grubs," live from two to four years. These burrow beneath the soil, especially in meadows and pastures, where they feed on the roots of the grass, sometimes completely killing it. At times they also ruin strawberry patches in the same way. No satisfactory method has yet been devised for combating these insects. When a field has become infested with them it is sometimes of advantage to let hogs run in it. These root in the soil and eat the grubs. The cockchafers and June-bugs, like other insects, occur at times in enormous numbers, while in other years they are comparatively few. Especially noticeable are two seasons in Europe. In 1574 they clogged the water-wheels along the river Severn, and in 1688 they were almost as abundant. J. S. K.

Cocker: a small active spaniel, weighing from 15 to 25 lb., with a thick wavy coat. There is no particular standard for color, but black is perhaps the most popular. The small size of the cocker fits it for ranging in coverts, and it is much employed by British sportsmen in pheasant and woodcock shooting; but it can not easily be trained to wait for the sportsman. It is sometimes called the "cocking-dog," probably taking both its names from the game it is employed to flush. F. A. Lucas.

Cocker, Edward: English teacher and educational writer; b. in 1632; resided in London. His famous *Arithmetic*, published after his death, had an enormous circulation, having passed through fifty-five editions from 1677–1758, and became a model for numerous later works upon the subject. D. about 1677.

Cock'erell, Charles Robert, R. A.: b. in London, England, in 1788; visited Italy, Asia Minor, etc., 1810–17; discovered Æginetan and Phigaleian marbles in 1811; in 1819 was appointed surveyor to St. Paul's, and held that office till his retirement from business; was elected a Royal Academician in 1836, and in 1840 became Professor of Architecture in the Royal Academy. He designed many important public buildings, and was for some years chief architect of the Bank of England. His most successful edifice was St. George's Hall, Liverpool. He published *On the Iconography of Wells Cathedral*; *On the Sculptures of Lincoln and Exeter Cathedrals*; *Tribute to the Memory of Sir Christopher Wren*. D. in London, England, Sept. 17, 1863.

Cock'erill, John: an English engineer and promoter of modern commerce; b. in Lancashire, Aug. 3, 1790. In 1802 he went to Belgium, where his father had long been employed as a machinist, and in 1816 established at Seraing, near Liège, a large machine-shop, the King of Holland being for a time in partnership with him. He also established coal mines, iron mines, and large factories in many parts of Europe. In 1839 he failed. D. in Warsaw, June 19, 1840.

Cock'ermouth: a town of Cumberland, England; on the river Derwent; at the mouth of the Cocker; 24 miles by railroad S. W. of Carlisle (see map of England, ref. 4–E). It is irregularly built, but presents a clean appearance. It has the remains of an old castle in which Mary Stuart was imprisoned. There are manufactures of linen and woolen goods, hats, hosiery, and paper. St. Mary's church, rebuilt in 1850, has a memorial window to the poet Wordsworth, who was born in this town. There are extensive coal mines in the vicinity. Pop. (1891) 5,464.

Cock-fighting: a sport which consists in setting two cocks to fight. It was formerly practiced by the Greeks and Romans, and probably also by the inhabitants of various parts of Asia. The ancients used partridges and quails also for this sport. It was popular in Great Britain for several centuries, and it was a recognized custom for schoolboys to spend Shrove Tuesday in cock-fighting, the masters also taking part in the sport. Henry VIII. added a cockpit to the palace at Whitehall. The sport has been prohibited by law several times in Great Britain, finally in 1849, since which time it has become practically extinct. At present it is carried on in the Spanish countries and in the East. It has also been popular in the U. S.

The cocks were specially bred and selected for the sport. Those of the breed called game fowl were used. They were neatly cut and trimmed for the battles to make them lighter and give less for their antagonists to lay hold of. They were frequently provided with artificial spurs made of silver or steel. There were usually heavy betting on the results of a main, which consisted in setting several cocks to fight. Cocks which were most nearly of the same weight were matched. Those not matched fell out of the main and fought byes. In the Welsh main the survivors of the first set of fights were matched with each other, and so on, until there was only one survivor.

Cockle [from Fr. *coquille*: Ital. *cochiglia*, from a vulg. Lat. variant of *conchylia*, plur. of *conchylium*, Gr. κογχύλιον, small mussel]: a name given to various mollusks, chiefly of the genus *Cardium*. The *Cardium edule*, or common cockle, and other species, constitute an important supply of food in the British islands and other European countries. The species are very numerous, and are chiefly tropical. *Cardium junonis* is one of the finest species. Several species occur on the Atlantic and Pacific coasts of the U. S.

Cockle, or **Corn-cockle** (Fr. *coquelicot*): a common name of the *Lychnis githago*, an annual plant of the family *Caryophyllaceæ*; a native of Europe; often occurring as a weed in the wheat-fields of the U. S. It produces black seeds, which are injurious to the appearance and quality of wheat flour. The lobes of the calyx are linear, and longer than the corolla, which is purple red.

Cockney [M. Eng. *coken-ey*, cock's egg; *coken*, of cocks + *ey*, egg. The development of meaning was: cock's egg, effeminate fellow, milk-sop, an inhabitant of city as distinguished from country, a Londoner]: In 1517 Henry VIII. made an order with reference to the feast of the King of the Cockneys, held on Childermas Day. The term Cockney school was applied to a literary coterie consisting of Hazlitt, Keats, Leigh Hunt, Shelley, etc.

Cock of the Plains: See Grouse.

Cock of the Rock (*Rupicola rupicola*): a bird of the family *Cotingidæ*, found in well-watered, mountainous districts of Guiana and Northeastern Brazil. The male is a foot long, of a rich orange color, with high purplish-red crest extending from the back of the head to the tip of

the bill, the feathers of the forehead pointing forward. The females and young are brown. The bird builds a nest, something like that of a chimney-swallow, on a large scale, in holes and fissures among the rocks. The feathers are much used by the Indians in ornamental work, and the skins are largely exported. F. A. Lucas.

Cock of the Woods: See Capercailzie.

Cockpit: in a ship of war, a room where the wounded men receive surgical treatment during an action. Formerly it was situated under the lower gun-deck.

Cockran, William Bourke: b. in Ireland, Feb. 28, 1854; educated in France and in his native country; removed to America when seventeen years of age; soon after his arrival received the appointment of teacher in a private academy; was principal of a public school in Westchester co., N. Y.; while engaged in teaching read law, and was admitted to the bar in 1876; was a member of the Fiftieth Congress; was a member of the commission to revise the judiciary article of the constitution of the State of New York; was elected to the Fifty-second and Fifty-third Congresses as a Democrat. Mr. Cockran is a prominent leader in Tammany Hall, and has won national distinction as an orator.

Cockroach, or **Roach**: a common name for a large number of flattened insects belonging to *Blatta* and allied genera of Orthoptera (*q. v.*). They are adapted for running, and have the head drawn back under the plate-like prothorax so that it is not visible from above. The wings are of little use in flight, and in the females of some species they remain undeveloped. The females lay their eggs in a satchel-shaped cocoon, which they carry about with them for a time. The young which hatch from the eggs closely resemble the parent in all but size and lack of wings. The larger proportion of the species live in the forests, where they feed upon decaying wood, etc., and are of little importance to man. A few species, however, exhibit a considerable partiality for human society and have followed man over the world. Of these the most ubiquitous in the U. S. is the small imported species known as the "Croton bug," or "black beetle" (*Phyllodromia germanica*), which multiplies rapidly and is difficult to exterminate. It is most apt to congregate about waterpipes, and with its flattened body can hide in the narrowest cracks. Most efficacious in ridding the premises of these pests is borax or insect-powder, liberally and perseveringly applied. The larger "common cockroach" (*Blatta* or *Periplaneta orientalis*) is fortunately less common with us. It is about an inch in length, blackish brown in color, and omnivorous in its diet. It infests houses, and especially mills, bakeries, and ships, and gives a disgusting smell to everything over which it passes. Its original home is unknown; it first appeared in Europe 200 years ago. Some of the tropical species are even larger, reaching a length of 2 inches. Fossil cockroaches occur in the Coal period. See Entomology (Fig. 7). J. S. Kingsley.

Cocks'comb [from the resemblance of the head of flowers to the comb of a cock]: the *Celosia cristata*, a tropical plant of the Amaranth family, cultivated for its showy flower-crests. These crests are clusters of very numerous small and inconspicuous flowers which are aggregated on a more or less flattened or fasciated stem, the brilliant scarious bracts producing the ornamental effects. The species is an annual of easy cultivation. It was formerly very popular, but it has suffered somewhat in reputation in recent years from the introduction of more graceful plant forms.

Cocles, kō'kleez, Publius Horatius: hero of Rome who in 507 B. C., with two companions, defended the bridge over the Tiber against the whole army of Lars Porsena while the bridge was destroyed behind him, whereupon he plunged into the river, and, although encumbered with his armor, reached the opposite shore in safety. He was rewarded with as much land as he could plow around in a day, and a statue was erected in his honor. His memory was held in great esteem. Macaulay has familiarized the legend in his *Lays of Ancient Rome*.

Cocoa: See Cacao.

Cocoanut: the fruit of the *Cocos nucifera*, a tree of the Palm Family (*q. v.*). The genus *Cocos* [from *coco*, the Portuguese for monkey, in allusion to the resemblance of the end of the nut to a monkey's face] includes about thirty species, all tropical, and nearly all American. They are tall or low trees, with slender or stout stems, bearing upon their summits a crown of widely spreading, mostly smooth, pinnately compound leaves. The stems are at first covered with the closely crowded bases of the old leaves, and when these fall away the surface is ringed and nearly smooth. The flowers are monœcious and are borne in spadices which appear in the axils of the leaves. The staminate flowers are irregular in shape, and contain small sepals and petals and six stamens. The pistillate flowers consist of sepals, petals, and a three-celled ovary, each with one ascending ovule. In the after-development of the ovary but one of the ovules continues its growth at the expense of the others; the fruit is therefore one-celled and one-seeded, there remaining nothing but mere vestiges of the other cells in the form of narrow crevices in the fruit-wall. The embryo is relatively small and consists of an elliptical or nearly cylindrical mass (in the cocoanut from a third to half an inch long) lying in the great mass of endosperm. The position of the embryo may be made out externally by the thinner areas in the bony shell. It will be seen that there are three thin areas, one for each of the ovules originally formed, and the most marked of these indicates the position of the embryo which is developed. In some species the endosperm is solid throughout, but in the cocoanut only the exterior becomes firm, the central portion being filled with watery contents, the so-called "cocoanut milk."

The cocoanut proper appears to have come originally from the East Indies, but it has been so long in cultivation that it has become widely distributed in all hot regions. The tree attains, when well grown, a height of 50 to nearly 100 feet, and its leaves may be as much as 20 feet in length. The nuts are borne in clusters of a dozen or more, and on the tree are covered with a thick covering of fibers, while each nut is imbedded in a firm, woody husk. It is impossible to enumerate here all the uses of this most valuable tree, and we may well quote the old adage, its uses "are as numerous as the days in a year." No part of the plant appears to be useless, and these uses are not confined to tropical climates. Thus the fiber from the spathe is used in the making of ropes, matting, brushes, brooms, etc.; the fiber from the stems is extensively used in the manufacture of brushes; the shells are made into ornaments; the nuts furnish a nutritious food throughout the civilized world, and yield a valuable oil used in making candles and burned in lamps. C. E. B.

Cocoa-plum: the edible fruit of the *Chrysobalanus icaco*, a shrub of the family *Rosaceæ*, growing in the southern part of the U. S. and the West Indies. The fruit resembles a large plum, yellow, purple, or black in color.

Cocoon: See Chrysalis and Silkworm.

Cocos Island: See the Appendix.

Cocos-Keeling Islands: See Keeling.

Cod: the *Gadus morrhua*; a fish of the family *Gadidæ*, the most abundant and important member of the group. The general appearance of the fish, which ordinarily reaches a length of 3 to 5 feet and a weight of 10 to 40 lb., is shown

Common cod.

by the cut. Fish of 50 or 60 lb. weight are not uncommon, and exceptional individuals have been taken weighing from 100 to 150 lb. The color is somewhat variable, being influenced by food and surroundings, but is usually brownish or greenish, although it may have a red or yellowish cast. The back and sides are marked with numerous dark spots: the lateral line is light and the fins dark. It is found at moderate depths, 10 to 150 fathoms, in the North Atlantic and Pacific, and while ranging south to Japan, Oregon, and Virginia, is most abundant in the northern portion of its habitat. Cod migrate with considerable regularity from deep into shallow water, or *vice versa*, being influenced by temperature, or by the pursuit of food, or for the purpose of spawning. The eggs are small and extremely numerous, a fish weighing 21 lb. containing 2,700,000 eggs, and one weighing 75 lb. the almost incredible number of 9,100,000. The period of spawning is protracted, lasting, on the coast of

Massachusetts, from September until the following May. Notwithstanding the vast number of eggs, so few reach maturity that the drain of continued fishing has made perceptible inroads on the numbers of cod, and hatcheries have been established for their artificial propagation. Nothing edible seems to come amiss to the cod, which eats squids, small fishes, hard-shelled mollusks, worms, crustaceans, and other invertebrates, while two ducks were found in the stomach of an unusually large specimen. F. A. Lucas.

Codazzi, kō-daăt'sĕe, Agustin: engineer and geographer; b. in Lugo, near Ferrara, Italy, 1792. He joined the Italian army as a volunteer, and took part in the campaign in Saxony, 1813, and in the defense of Mantua, 1814. Subsequently he traveled for commercial purposes in nearly every country of Europe. In 1817 he went to the U. S., and thence joined an expedition of Venezuelan revolutionists against the island of Margarita; he served with the patriot army in several campaigns, entering the service of Colombia; went to Europe in 1823, but returned to Bogotá in 1826, where he again took service with the rank of lieutenant-colonel of artillery. He was employed in making charts and maps until the separation of Venezuela from Colombia, when he was engaged by the latter country to make maps of all its departments. This great work occupied him from 1831 to 1838, and to complete it he made an expedition into the unexplored regions south of the Orinoco, penetrating nearly to the head-waters of that river. He was rewarded with the grade of colonel, and was commissioned to publish the results of his work in Paris; they appeared in 1841 with the title *Resumen de la Geografía de Venezuela* (8vo, with atlas and a large map). Returning to America, Col. Codazzi was employed after 1848 by the Colombian Government. Among his later works were surveys of the Panama Isthmus, with special reference to the discovery of routes for a ship-canal. D. in Colombia, June, 1859.

Herbert H. Smith.

Cod'dington, William: b. in Lincolnshire, England, in 1601; was sent as a crown magistrate to Salem, Mass., in 1630; was a merchant of Boston; opposed Winthrop and the clerical party with Vane, defending the Antinomianism of Anne Hutchinson and Wheelwright; led a dissenting party to Aquidneck, or Rhode Island, in 1638; was chosen chief magistrate to be guided by God's laws; from 1640 was officially called governor until 1647; went to England in 1649, and in two years obtained a life commission to rule Aquidneck and Conanicut islands; his commission was revoked in 1652 at the instance of Williams and Clark, but until 1655 he refused to submit, and still retained possession of the records; in 1665 he became a Quaker and an advocate of liberty of conscience. He was again governor (1674–75). D. Nov. 1, 1678. See No. 4, *Rhode Island Historical Tracts* (Providence, 1878).

Code (Lat. *codex*): a collection of laws made by public authority. In modern law it more commonly means a methodical arrangement of law, either customary or statutory, in chapters and sections. In a number of the U. S. the general statutes (see Statutes) are arranged in this manner under the title of *Revised Laws*, *Revised Statutes*, or *Codes*. How far it is practicable to accomplish useful results in the codification of customary or common law is a subject of much controversy among jurists. On the one hand, it is claimed that as law of this nature can be enunciated or stated, the statement can be reduced to writing in the form of general and particular propositions. It is added, as to the common law of England, that it has been for ages in writing, and that all that is now known of it is derived from written sources, such as reports and treatises of recognized authority. The rules there found are susceptible of collation, analysis, and systematic arrangement. The materials thus obtained may be recast by the codifier, and molded into the form of positive and authoritative statement in *his own language*. True, the judge in deciding a cause states a principle as applied to the particular cause before him; the codifier may seize upon the principle that underlies the specific case, and state it in a positive and precise form. From this mode of collecting and arranging legal propositions it is claimed that a number of benefits will be secured, such as reducing the labor of lawyers, decreasing the size of their libraries, introducing legal reforms by comprehensive legislation, and affording to the public increased opportunities to become acquainted with general rules of law. On the other hand, it is urged that a code, being inflexible in its character, prevents the true growth of law. Discussions in court will turn upon the construction of *words* used in the code, instead of there being an examination of legal principles. The interpretation of specific words is to the last degree attended with uncertainty. Leading inquiries concerning the great statute of frauds passed in the reign of Charles II. are still regarded in the courts as open to consideration. This objection is truly formidable. Where customary law prevails, little if any attention is paid in the decision of causes to the particular language in which the court in a former case cited as a precedent expressed its views. The principle of the decision is seized upon and stated in perhaps wholly different words. The arguments applied to the construction of statute or codified law must, from the nature of the case, be in the main textual criticism. There must be interpretation of particular words, reconciliation of discordant phrases, and minute consideration of mere forms of expression. While a rule of law is in process of formation discussions as to its true principle should be as free and unfettered as possible until, after a long interchange, and perhaps collision, of opinions, the true rule is evoked, with its various qualifications and limitations. This process, so beneficial in its character, could not be made available if the rule in its early stages had already been hardened into fixed forms of statute law. Mr. Austin, in his great work on jurisprudence, though from the bent of his mind inclined to favor codification, sees the great difficulties attending it in its more perfect forms, and suggests that the work can only be accomplished successfully, if at all, by lawyers of the very highest ability and most comprehensive views, for no others can see the full scope of the subject and draw the needful sections. It may be added that in a country like the U. S., where legislation is fluctuating and often inconsiderate, there would be great danger, even though a well-devised code of laws were once introduced, that its symmetry would shortly be marred and the coherence of its provisions broken up. No argument for a code in the modern sense can be derived from the work of Justinian on the Roman law. The *Pandects*, the great body of the Roman law, is, in the main, a mere collection of extracts from distinguished writers in *their own language*, and which had already become settled law. The *Institutes* are substantially a bare reproduction of a well-known work of Gaius, a distinguished Roman jurist. Besides, the development of the Roman law was different in some respects from our own. In that system much was made of the opinions of text-writers, while nearly the whole development of English jurisprudence has taken place through the medium of adjudged cases or "case law." The true method of growth would seem to be that the courts should render decisions, while text-writers of ability should collect them, arrange the principles in a scientific manner, criticise them when faulty, and call the attention of the courts to needful improvement. By the work thus done law would make a steady progress, and adapt itself to the wants of the community. Radical changes must be produced by legislation. It is in vain to hope that a code will reduce libraries or make thorough study unnecessary. Jurisprudence will take on an historical form, for courts must apply the code to specific cases, and a body of case law will soon grow up, the roots of which will be sought in the past as heretofore, and its results modify the code itself, just as great masses of case law collect around an instrument so brief as the U. S. Constitution. See Austin *On Jurisprudence*, vol. ii., p. 1129; Pomeroy's *Introduction to Municipal Law*, chap. iii.; and the works of Savigny.

Some of the leading codes may be referred to.

1. *Justinian's Code of Roman Law.*—The word *code* is used here as describing the whole mass of codified Roman law under the order of the Emperor Justinian, including the *Code* of that system; the *Institutes*, *Pandects*, and *Novels*. These, taken together, constitute the *corpus juris civilis*, or whole body of civil law. These will be more fully considered under Law, Civil (*q. v.*). The Theodosian code of Roman law may also be referred to, which is of comparatively little interest. See *Foreign Quarterly Review*, vol. ix., 374.

2. *French Codes.*—Of these there are five principal ones—the civil code, of civil procedure, of commerce, of criminal procedure, and of criminal law. There are also codes upon special subjects. French codification is largely due to the Emperor Napoleon I.

3. *Code of Louisiana*, based on the *Code Napoléon*, and principally prepared by Edward Livingston. It is divided into three books, and is concerned with the civil as distinguished from the criminal law. Mr. Livingston also pre-

pared a draft of a penal code for the State, which was not adopted, as well as one for the U. S. These are to be found, together with introductory reports explaining the grounds of them, in a work published by the National Prison Association, with an introduction by the late Chief Justice S. P. Chase, A. D. 1873.

4. *New York Code of Procedure.*—The object of this is to assimilate law and equity, and to have but one form of action. It assumes to regulate in a general way both pleadings and practice, and to state in a condensed form the general rules. A large body of case law has grown up in connection with the code regulations. The results of these decisions are collected in *Annotated Codes*, or in works of practice. The system has been adopted in substance in a considerable number of the States. Penal codes, embracing both the principles of the criminal law and its practice, have been enacted in New York. Commissioners in that State have also reported a political code and a civil code which have not become law.

Mention may also be made of various collections of maritime rules, such as the *Consolato del Mare*; *Laws of the Hanse Towns*; *Ordonnance de la Marine* (of the time of Louis XIV. of France); *Laws of Oléron*; and the *Laws of Wisby*, which will be noticed again in connection with maritime law, as well as of the code of Prussia, etc.

T. W. Dwight.

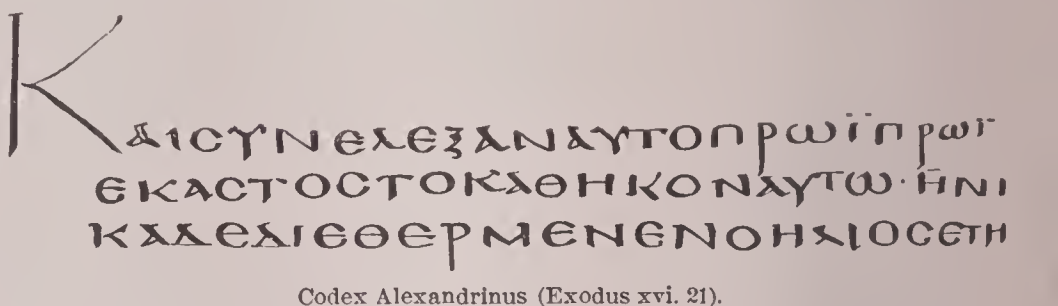
Codeine, kō-dee'in [from Gr. *κώδεια*, poppy-head]: one of the alkaloids ($C_{18}H_{21}NO_3$) to which opium owes its hypnotic powers. Its salts are sometimes administered in place of morphine. It is asserted that it possesses many of the valuable properties of that drug, without its disadvantages. The dose is much larger than that of morphine. See Opium.

Co'dex (plu. **Cod'ices**) [Lat., trunk of a tree, wooden tablet, document, writing]: In modern Latin, codex is a manuscript volume, and is especially applied to a manuscript copy of the Scriptures. They are divided into *uncial* and *cursive*. The former are older, written on parchment in large or capital letters (*literæ unciales* or *majusculæ*); the latter date from the eighth to the fifteenth century, and are written in small or minuscule letters (*literæ minusculæ*). The uncial codices of the Greek Testament are for the sake of beauty designated by the large letters of the Latin alphabet (A, B, C, D, etc.), the cursive by figures (1, 2, 3, etc.). We have now over one hundred uncial MSS. (counting all the fragments; only three or four are complete) and 3,553 cursive MSS., as counted by Gregory in 1890. *Codex rescriptus* is a synonym of Palimpsest (*q. v.*). Of the New Testament, as well as of any other ancient book, other things being equal, the older the MS. the greater its authority, because nearer the original source; but later testimony has also its proper weight. Scholars have very carefully compared and considered the later MSS., as well as the older, the citations from the Bible in the Fathers, the old versions, and every document of every kind which could assist in determining the original text. It was upon a thorough and careful consideration of all these witnesses, by the most competent scholars and experts, that the revisers of the translation of the New Testament in 1881 based the text which they adopted, and accordingly that text stands on impregnable ground. See Bible; also Tischendorf, Schaff (*Companion to the Greek Testament*, 4th ed. 1892), and Gregory (*Prolegomena* to Tischendorf's 8th ed., part i. 1884; part ii. 1890; the third part is not yet published).

Philip Schaff.

Co'dex Alexandri'nus, or **Alesandri'nus** (designated A since Wetstein, 1751): the third in antiquity of the great uncial (or large letter) extant manuscripts of the Bible in the Greek language. It contains 773 leaves of the Old Testament (in the Septuagint version), with some deficiencies in the Psalms, and all the books of the New Testament, with a few chasms (Matt. i.–xxv. 6; John vi. 50, viii. 52; 2 Cor. iv. 13, xii. 6) where leaves are wanting. To these it adds the one genuine, and a fragment of the apocryphal, Epistle of Clement of Rome to the Corinthians. The Catholic Epistles follow the Acts; then come the Pauline Epistles, then that to the Hebrews before the Pastoral Epistles: the Apocalypse, which is rare in extant manuscripts, stands at the close of the New Testament.

This codex is now in the British Museum, having been presented to Charles I. in 1628 by Cyril Lucar, Patriarch of Constantinople, who had previously been Patriarch of Alexandria, from which city he brought the manuscript. It is in quarto form, about 13 inches high and 10 broad, each page being divided into two columns of fifty lines each, having about twenty letters or upward in a line. It is written on thin, fine, and very beautiful vellum, in uncial letters of an elegant yet simple form, and without any space between the words. The punctuation, which is infrequent, consists merely of a point placed at the end of a sentence, usually on a level with the top of the preceding letter; and a vacant place follows the point at the end of a paragraph, the space being proportioned to the break in the sense. The black ink in which the body of the codex was written has turned to a yellowish brown; but the vermilion, freely used in the initial lines of the different books, is still bright. The manuscript bears an ancient Arabic inscription on its margin, asserting that it was written by the martyr Thecla; Tregelles, however, explains the origin of this inscription by remarking that the New Testament in the codex as we have it commences with Matthew xxv. 6, this lesson (Matthew xxv. 1–13) being that appointed by the Greek Church for the festival of St. Thecla. The Egyptian, therefore, who wrote this Arabic note, observing the name of Thecla on the now mutilated upper margin of the codex, where such *rubrical* notes are commonly placed by later hands, hastily concluded that she wrote the book. But though not by Thecla, it may be that the neat chirography of the codex is due to a female hand, for we know that women as well as men were employed as copyists at Alexandria.



Codex Alexandrinus (Exodus xvi. 21).

Καὶ συνέλεξαν αὐτὸ πρωΐ πρωΐ, ἕκαστος τὸ καθῆκον αὐτῷ· ἡνίκα δὲ διεθέρμενεν ὁ ἥλιος, ἐτή-*

The general consent of palæographers refers this manuscript to the beginning or middle of the fifth century of our era. In the general style of the writing and in the shape of the letters (especially those which furnish the best tests, as *α*, *δ*, *ε*, *π*, *σ*, *φ*, and *ω*), it holds a middle place between copies of the fourth and sixth centuries. There are no accents or breathings, and the contractions of words (as ΘC, IC, XC, ΠΗΡ, KC, etc., for *Θεος*, *Ιησους*, *Χριστος*, *Πατηρ*, *Κυριος*, etc.) are only such as are found in other manuscripts of the more ancient class. Of itacisms (as the interchange of *ι* and *ει*, *η* and *ι*, *ε* and *αι*) it contains no more than others of the same date. The references in the margin to the tables of parallel passages called the *Canons of Eusebius* (A. D. 268–340?), and the insertion, before the Psalms, of the epistle to Marcellinus by Athanasius, Patriarch of Alexandria (A. D. 300?–373), prove that the manuscript was not written before the fourth century; while the absence of the so-called Euthalian divisions of the Acts and Epistles into chapters, which came into vogue very soon after 458, and the shortness and simplicity of the *subscriptions* at the end of the books, appear tolerably decisive (says Scrivener) against a later date than about 450. The insertion of the Epistles of Clement points to a period when the canon of Scripture was in some particulars unsettled, or about the age of the Synod of Laodicea (363). It appears from the table of contents that the manuscript formerly contained the apocryphal Psalms of Solomon, but these are separated from the other books in the list, as different in kind. This separation conforms to the prohibition of such psalms, at the Synod (or, as it is sometimes called, Council) of Laodicea, from being read in churches.

This manuscript is of great importance to the critic, and exhibits a text more nearly approaching that found in later copies than is read in others of its high antiquity. It is designated, in critical editions, by the letter A. It has been published in elegant style, in *quasi* fac-simile, uncial type,

* For *διεθέρμαινεν*.

bearing a general resemblance to the written characters, having been cast for the purpose, and (what is more important) the edition exhibiting the manuscript page for page, line for line, and letter for letter. The handsome folio volume containing the New Testament appeared in 1786, edited by Charles Godfrey Woide; the four folio volumes containing the Old Testament were edited by Henry Hervey Baber, and published in 1816–28. An edition of the New Testament, in small letter, in which Woide's text has been corrected from the manuscript itself, was published in 1860, edited by B. H. Cowper. The Old Testament has been edited by Field. The trustees of the British Museum have published a beautiful photographie fac-simile which supersedes all former editions (London, 1879 and 1882).

THOMAS CHASE.

Co'dex Be'zæ or **Cantabrigien'sis** (designation, D): an uncial manuscript, probably of the sixth century, containing the four Gospels and the book of Acts in Greek and Latin on opposite pages. It was presented to the University of Cambridge in 1581 by Theodore Beza, who obtained it during the Freneh civil wars in 1562, when it was found in the monastery of St. Irenæus at Lyons. This manuscript has several peculiar features. The Gospels stand Matthew, John, Luke, Mark, an order found also in some of the manuscripts of the Old Latin version. The peculiarities in the text are striking, consisting of interpolations, sentences reeast, and occasional omissions. The interpolations had probably been introduced into some still older eopy from the margin of another manuscript, where they had been subjoined by some who wished to *add* whatever they could obtain from tradition and various sources to make the narrative more full and complete. Among the most interesting additions is the following at the end of the fourth verse of the sixth chapter of Luke: "And on the same day he saw a man working on the Sabbath: and he said unto him, O man, if thou knowest what thou art doing, blessed are thou; but if thou knowest not, thou art accursed and a trangressor of the law." These additions removed, the text which remains is valuable for comparative eriticism, and is strongly corroborative of the other most ancient MSS.

The text of this codex, both Greek and Latin, was published by Dr. Thomas Kipling at Cambridge in two handsome folio volumes in 1793, in type cast for the edition, so wonderfully exact that it possesses nearly all the advantages of an actual fac-simile. A more scholarly and accurate edition was brought out in 1864 by F. H. Scrivener. Whiston, who had an extravagant admiration of the manuseript, published an English translation of it in 1745. A valuable study of this *Codex*, by J. Rendell Harris, is published as the eighth number of *Haverford College Studies*.

THOMAS CHASE.

Co'dex Ephrae'mi, or **Co'dex Ephrae'mi Sy'ri Rescrip'tus** (designation, C): an ancient and valuable palimpsest manuscript of portions of the Greek Bible, preserved in the National Library in Paris. It was brought from the East by Andrew John Lascar, a learned Greek patronized by Lorenzo de' Medici, and Catherine de' Mediei carried it to France. The ancient writing is read with difficulty, having been erased about the twelfth eentury in order that the vellum night be used for transcribing some Greek works of the Syrian Father Ephraem. The treasure which lay below was first noticed by Peter Alix in the latter part of the seventeenth century. Several readings from the palimpsest were published by Küster in 1710 in his reprint of Mill's *Greek Testament*. In 1716 Bentley sent Wetstein to Paris to collate the whole manuscript. This work, for whieh £50 was paid, was performed as far as was then possible. Wetstein told Bentley that it had cost him two hours to read one page. This eollation Wetstein used in his own edition of the Greek Testament (1751–52). In 1834 a ehemical preparation (*tinctura Giobertina*) was applied to the leaves in order to revivify the ancient writing. But although mueh that had been illegible was thus brought fully to light, every part of the manuscript was stained and discolored in the process, and some passages made more difficult to read than before. The conquest of all the difficulties which beset the deciphering of this eodex is one of the greatest triumphs of Tischendorf. This enthusiastic, patient, keen-sighted, and skillful palæographer occupied himself from Dec., 1840, till Sept., 1841, in examining and eopying the manuscript for publication, and has given the world the first complete transcript of it; the New Testament portion being published at Leipzig in 1843, the Old Testament in 1845.

Codex C is an uncial manuscript, about the size of Codex A, but written in eharaeters a little larger and somewhat more elaborate, and with but one eolumn on a page. All its characteristics point to a date as early as the fifth century. Three correctors at least have left on it traees of their work; the earliest may have been of the sixth century, the second (who revised such portions only as were used for ehurch lessons or other ecclesiastical purposes) perhaps of the ninth. By him and by the third hand (whose changes are few) small crosses were interpolated as stops, and there are marks of cantillation as guides in intoning. In critical authority Tregelles places this MS. next to the Sinaitic and the Vatican.

T. CHASE.

Co'dex Sinait'icus (designated ℵ *aleph*): the most recently discovered of the nearly complete uncial manuscripts of the Greek Bible, and inferior to no other in antiquity, authority, and completeness.

In 1844 Constantine Tischendorf—who, although but twenty-nine years old, was already famous as an editor of the *Greek Testament* and as the deciphercr of the *Codex Ephraemi*—in a journey undertaken in search of ancient manuscripts of Holy Writ, arrived at the ancient Greek convent of St. Catharine on the range of Mt. Sinai. Here he was shown a beautiful codex of the Gospels, the pride of the eonvent, written upon exquisite white parehment in letters of gold, and adorned with beautiful paintings of the four Evangelists, our Saviour, the Virgin Mary, and the apostle Peter, and said to have been the gift of Theodosius III. From the charaeter of the writing it must date from the seventh or eighth century; but Tischendorf found it very inaccurate, and of slight eritical value. Something much more precious than this costly codex had been thrown aside as worthless by the guardians of the convent library. In a large basket filled with remains of torn and damaged manuscripts which stood in the middle of the room, Tischendorf found a considerable number of vellum leaves of a Greek manuscript of the Septuagint version of the Old Testament, which his practiced eye at onee reeognized as one of the oldest in existence. The contents of the basket had been destined for the flames, two baskets full of similar materials having been already burned in the stove. Tisehendorf easily obtained possession of forty-three sheets, about one-third of the number whieh he rescued, but was not permitted to take the other portions, nor even to copy more than a single leaf. Unfortunately, he had betrayed the value of the treasure of which the monks had been so uneonseious. Of the portion he obtained he published a lithographic fae-simile in 1846, under the name of *Codex Friderico-Augustanus*, in honor of his patron, Friedrich August, the King of Saxony. Of eourse, Tischendorf was hoping all the time that he should at length obtain the rest of the manuscript. He made proposals for it through a friend whom he had found at the eourt of the Viceroy of Egypt, but only to learn that the monks, having learned its value, would not part with it for any sum of money. In 1853 he visited the monastery a second time, in the hope of being permitted to eopy those parts of the eodex whieh he had left behind, but he could gain no tidings of them. He found, however, one trace of the eodex—a single shred, in a roll of parchment, containing eleven lines from the first book of Moses. But few years passed before Tischendorf felt impelled for a third time to journey to the East, in the hope of prosecuting his search for ancient copies of the sacred text over a wider field and more fully than before. To faeilitate his researehes, he gained the powerful patronage and protection of the Emperor Alexander II. of Russia, the great champion of the Oriental Orthodox Church, and of his imperial consort. Near the beginning of the year 1859 the enthusiastie scholar presented himself for the third time at the gates of the eonvent. After repeated ealls from below, a door in the convent wall was opened 30 feet above the ground, and a rope let down to receive the letters whieh the traveler brought. Ordinarily, guests are reeeived through this same door, seating themselves on a cross-piece of wood at the end of the rope, and being then drawn up by the servants of the eonvent. Tischendorf's eredentials proeured him a more distinguished reception. In honor of his imperial commission the steward of the convent soon appeared in person, in the name of the prior, and conducted the guest, through a door seldom used, "into the still, friendly asylum." The luggage and the dragoman took the usual journey through the air.

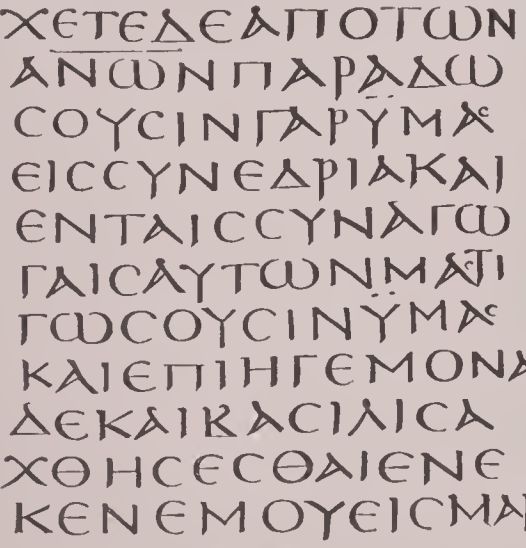
After five days' tarriance, during whieh Tisehendorf had carefully examined the treasures of the library, as well as

ascended Mt. Sinai, when he was preparing to take his departure, and had sent his Bedouins after the camels, as he was taking a walk with the steward, the conversation turned upon the text of the Old Testament. Returning at twilight to the convent, the steward invited him to partake of a luncheon in his cell, and while they were eating remarked that *he* had here a copy of the Septuagint, thereupon bringing out of a corner of the room a large manuscript, wrapped in a red cloth, according to the Oriental custom, which he had brought to his own cell from the library of the σκευοφύλαξ, or keeper of the sacred utensils. Glancing at the pile of vellum, Tischendorf soon recognized it as belonging to the same codex of which he had rescued some leaves from the basket of fuel fifteen years before; and, eagerly turning over the sheets, beheld, to his astonishment, in addition to a large part of the Old Testament, the beginning and the end of the New, and the Epistle of Barnabas. It appears that soon after the original discovery in the waste-basket the monks had found these sheets, and placed them with the fragments which Tischendorf rescued from destruction. The German guest, concealing his emotion, begged the privilege of taking the manuscript to his chamber; to his unspeakable joy, he found that it contained the New Testament *entire*, whereas all the other manuscripts of the first class (as regards antiquity) are more or less imperfect; and he could not withhold an offering of praise and thanksgiving to that Being who had suffered so valuable a boon for the Church of Christ to come into his hands. The first night he spent in transcribing the Epistle of Barnabas (now found for the first time entire in the original Greek), in spite of a dim lamp and the cold temperature; "indeed, it seemed impious to sleep."

Understanding the aversion of the monks to part with manuscripts in their possession, Tischendorf asked and obtained, after some opposition, permission to copy the whole codex at Cairo, where there were greater facilities for the work than at the convent. Assisted by two of his own countrymen, with incessant toil he completed his transcript, but he was not able to give his copy that careful revision and comparison with the original without which it would be unfit for publication. At Tischendorf's suggestion the monks were at last persuaded to offer the whole codex as a gift to the great monarch whom they recognized as the shield and bulwark of the Eastern Church; and in a little less than eight months after his discovery of the treasure they committed it to his hands to be borne to St. Petersburg—to be held for a time, however, as a loan made simply to facilitate the publication of an accurate edition, until the confirmation of their new archbishop's election should enable him to present it formally to the emperor, as he afterward did.

The *Codex Sinaiticus* is written upon vellum sheets of extreme fineness and beauty, the delicate skins of antelopes or of wild asses (probably the former). It consists of 346 leaves, of which 199 contain 22 books of the Old Testament and Apocrypha in the Septuagint version, beginning at the first book of Chronicles; while the remaining 147 present *the whole* of the New Testament, the Epistle of Barnabas, and a part of the Shepherd of Hermas. (To these should be added the 43 leaves of the *Codex Friderico-Augustanus*.) It is written in uncial letters of exceeding beauty and simplicity of shape, approaching closely to the forms of the best papyri. Such testing characters as alpha, delta, epsilon, pi, and sigma are as unadorned as possible, without flourishes, knobs, or thickened points at their extremities—a proof of antiquity. It resembles the *Vatican Codex* in the absence of *initial* letters larger than the rest, which seem to have been regularly used after the beginning of the fifth century. It has but little punctuation, and that in the oldest manner. Its peculiarities of orthography and etymology belong to a period as early as the fourth century of our era. It is conspicuous for the brevity of its titles and subscriptions—e. g. "According to Matthew," "Acts," "To (the) Romans." Longer titles, as "The Holy Gospel according to Matthew" (wrongly translated in our version "The Gospel according to St. Matthew"—*Horne's Introduction*, 3d ed., p. 410), were not introduced until a later date.

It has, moreover, certain other signs of antiquity peculiar to itself. It has always been regarded as one of the striking proofs of the remote age of the *Vatican Codex* that it is written in three columns on each page, presenting to the eye, when the book is open, six narrow columns at once, thereby the more closely resembling the appearance of the ancient *volumina* or papyrus scrolls when extended for reading. Just as in the first books printed after the invention of printing many of the peculiarities of the manuscripts were carefully imitated, so when manuscripts began to be written on leaves instead of scrolls it is natural to suppose that some of the peculiarities of the older form would be retained. A very few other manuscripts have been found with the same number of columns on a page as the *Vatican*. But the *Sinaitic Codex* stands *alone* among known manuscripts in presenting *four* narrow columns on a page, seldom exceeding 2 inches in breadth, and *eight columns* at once when the book is opened; so that its claims to the benefit of this argument for antiquity are the strongest. This fact, with certain other indications, renders it probable that this codex was copied directly from an old Egyptian papyrus manuscript. The remarkably large size and great beauty of the vellum sheets is another proof of high antiquity. In size, indeed, they are the largest known, "each page being even at present as large as 13½ inches in length, by 14⅞ inches high, although marginal notes have sometimes been partially cut off by the ancient binder." A single animal could contribute only two leaves, or one sheet, of such unusual size. As time went on, smaller and coarser sheets of parchment took the place of the exquisite vellum used in the oldest manuscripts. The peculiar order in which the books of the Bible follow each other corresponds with what Epiphanius, who flourished toward the end of the third century, testifies to as existing in some manuscripts of his day, and proves that the codex was written before our present order had become established; while the presence of the Epistle of Barnabas and the Shepherd of Hermas is a strong indication that it was written before the age of Cyril of Jerusalem and the so-called Council of Laodicea (about A. D. 363). Those divisions called "the larger chapters," with their corresponding summaries of contents, which appear in all the copies of the Gospels written from the fifth century downward, are wanting in the Sinaitic and Vatican manuscripts alone. On the other hand, the *Sinaitic Codex* exhibits the Ammonian sections and Eusebian canons in red ink in the margins; which, if written by the original copyist, prove that the manuscript can not be ascribed to an *earlier* date


ΧΕΤΕ ΔΕ ΑΠΟ ΤΩΝ
ΑΝΩΝ ΠΑΡΑΔΩ
COYCIN ΓΑΡ ΥΜΑC
ΕΙCCΥΝΕΔΡΙΑ ΚΑΙ
ΕΝ ΤΑΙC CΥΝΑΓΩ
ΓΑΙC ΑΥΤΩΝ ΜΑΣΤΙ
ΓΩCOYCIN ΥΜΑC
ΚΑΙ ΕΠΙ ΗΓΕΜΟΝΑC
ΔΕ ΚΑΙ ΒΑCΙΛΙCΑ
ΧΘΗCΕCΘΑΙ ΕΝΕ
ΚΕΝ ΕΜΟΥ ΕΙC ΜΑΡ

Codex Sinaiticus (Matthew x. 17, 18).

-χετε δὲ ἀπὸ τῶν ἀνθρώπων·* παραδώσουσιν γὰρ ὑμᾶς εἰς συνέδρια, καὶ ἐν ταῖς συναγωγαῖς αὐτῶν μαστιγώσουσιν ὑμᾶς· καὶ ἐπὶ ἡγεμόνας δὲ καὶ βασιλῖς † ἀχθήσεσθαι ‡ ἕνεκεν ἐμοῦ, εἰς μαρ-#

* ΑΝΩΝ is a contraction for ΑΝΘΡΩΠΩΝ.
† For βασιλεῖς.
‡ For ἀχθήσεσθε.
# An English Bible printed in the same style would read somewhat as follows:

WAREOFMNFORTHEY
WILLDELIVERYOUUP
TOTHECOUNCILSAND
THEYWILLSCOURGE
YOUINTHEIRSYNA
GOGUEsANDYESHALL
BEBROUGHTBEFORE
GOVERNORsANDKINGs
FORMYSAKEFORATES

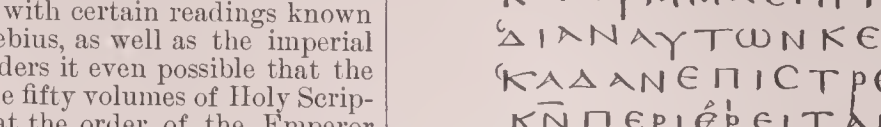
than some time within the first half of the fourth century, for Eusebius died in 340.

There is a striking agreement between the readings of this codex and those defended by Origen (186–253); while the marked coincidence of its text with certain readings known to have been approved by Eusebius, as well as the imperial beauty of the manuscripts, renders it even possible that the *Codex Sinaiticus* was one of the fifty volumes of Holy Scripture which Eusebius himself, at the order of the Emperor Constantine, caused to be prepared on beautiful skins by skillful calligraphists in the year 331, soon after the foundation of Constantinople. At any rate, we can assign it with moral certainty to the fourth century of our era, and with the highest probability to the first half of the same.

The publication of the original text of this and other ancient manuscripts is rendered difficult by the various *corrections* they have undergone in different ages. The *Codex Sinaiticus* abounds in such alterations, "brought in by at least ten different revisers, some of them systematically spread over every page, others occasional or limited to separate portions of the manuscript, many of them being contemporaneous with the first writer, far the greater part belonging to the sixth or seventh century, a few as recent as the twelfth." In many cases nothing short of the skill of a Tischendorf can identify with certainty the original writing under the alterations.

The *Codex Sinaiticus* was published in a style worthy of its importance and value. The enlightened sovereign of Russia was easily persuaded to signalize the thousandth anniversary of the establishment of his empire, in 1862, by bringing out an edition of the manuscript—now properly characterized by the additional title of *Petropolitanus*—in a style surpassing in splendor and in accuracy of imitation any previous work of the kind. The text is printed in three folio volumes (ii.–iv.), the leaves of the shape and size of those in the manuscript itself; the first volume contains valuable introductory matter, and twenty-one admirable fac-simile plates, representing chiefly pages of the manuscript, and two being covered with fac-simile specimens of other important manuscripts for comparison. The work is "printed upon paper at once thick and fine, the ink being made to resemble that of the original in color, and the type being greatly varied, so as to imitate the various shapes and sizes of the letters employed by the scribe: the very spaces, too, between the letters have been carefully measured and represented with all faithfulness." Only 300 copies of this truly imperial edition were printed, 200 of which were distributed by the emperor himself as presents to various public bodies and learned men; the rest were given to Tischendorf for sale, their price being fixed by him at 230 Prussian thalers. Several of the foremost colleges and libraries in the U. S. possess this valuable work, in a few instances as a donation from its imperial patron. A cheap manual or popular edition, containing the New Testament and its appendages in ordinary Greek type, was published in 1863; and an octave edition of the New Testament, together with the variations of the Vatican manuscript and of the Elzevir edition from the Sinaitic readings, appeared in 1865, with a supplement of additions and corrections in 1870. English readers will be interested in examining the various readings of the three most celebrated manuscripts of the original Greek text as presented by Tischendorf in his edition of the authorized English version of the New Testament, which was published by Baron Tauchnitz in 1869 as the thousandth volume of his *Collection of British Authors*. Tischendorf himself has told the romantic story of his most important discovery in several publications, most fully in his *Die Sinaibibel, ihre Entdeckung, Herausgabe und Erwerbung* (Leipzig, 1871). Revised by PHILIP SCHAFF.

Co'dex Vatica'nus (designation, B): a beautiful uncial manuscript of the Greek Bible in the Vatican Library, dating from the fourth century. Its marks of antiquity are similar to those of the Sinaitic codex; and indeed Tischendorf is confident that it is one of thirty copies of the Scriptures which Eusebius, the Church historian, had prepared by order of the Emperor Constantine in 330 for the churches of Constantinople. It presents three narrow columns on a page, except in the poetical books of the Old Testament, which, as in the *Codex Sinaiticus*, are written stichometrically (in verses clause by clause, according to the sense) in two columns. It is written on fine, thin vellum, in a square, plain, and noble style of handwriting, being a close resemblance in shape to that of the Herculanean papyri. The manuscript contains the greater part of the Old Testament, and the new as far as Hebrews ix. 14. It appears to



Codex Vaticanus (2 Corinthians iii. 15, 16).

κάλυμμα ἐπὶ τὴν καρδίαν αὐτῶν κεῖται· ἡνίκα δ' ἂν ἐπιστρέψῃ πρὸς κύριον, περιαιρεῖται τὸ κά-*

* $\overline{\text{KN}}$ is a contraction for KYPION.

have belonged to the Vatican Library from the latter part of the fifteenth century. Its earlier history is unknown, but Tischendorf regards it as the work of an Alexandrian scribe. In critical authority it is inferior to no other manuscript.

This codex has always been difficult of access. Scholars all over the world rejoiced when it was announced that Cardinal Mai was preparing an edition of it. After a long delay, his edition appeared in the Christmas holidays of 1857, three years after his death; but it proved to have been so carelessly executed as to be of little value; a smaller edition, also prepared by the cardinal, appeared in 1859, avoiding some of the errors of the former, but introducing almost as many new ones. Mai's edition was reprinted in several places—in Berlin with corrections by Philip Buttmann. In 1867 the New Testament was published in Leipzig, in common cursive characters, by Tischendorf; but he had been allowed to collate the whole manuscript no farther than partly through the third Gospel, and only to consult it on difficult or doubtful passages beyond that point. While falling short of the *highest* character, on account of the restrictions placed upon his use of the manuscript, this edition will generally be held decisive on the disputed points on which its editor gives his deliberate judgment upon personal examination of the passage. The codex was soon afterward published by papal authority, in magnificent style, edited by Carlo Vercellone and Giuseppe Cozza. The size and shape of the manuscript are accurately represented, and it is copied line for line and letter for letter, in printed characters approaching fac-simile, Tischendorf having lent for the purpose the type which had been cast for the imperial edition of the *Sinaitic Codex*, and the writing being astonishingly alike in the two manuscripts. The first volume published, but the fifth of the entire work, containing the New Testament, appeared in 1868. In one of the subsequent volumes containing the Old Testament, Vercellone was replaced by Caietano Sergio. The New Testament was published in a photographic fac-simile (100 copies, at $50 per copy), in Rome, 1889.

Revised by PHILIP SCHAFF.

Codicil (Lat. *codicillus*, dimin. of *codex*): an addition to or qualification of a will. It may add to or take from, explain, alter, confirm, republish, or revive any will with which it is incorporated. A will may have several codicils, in which case all the codicils form a part of the will to which it is attached or refers. A codicil revokes so much of a will as is inconsistent with it. Codicils must be executed with all the formalities required for the execution of wills; and due execution of a codicil cures all defects in the execution of the will to which it relates, and proof of the execution of the codicil makes unnecessary proof of the execution of the will itself. A codicil need not be physically annexed to the will to which it relates, but it is sufficient that the language of the codicil clearly identifies the will which it supplements. HENRY WADE ROGERS.

Codlin, or **Codling**: any one of several varieties of apples, some of which are highly esteemed in England, and are used chiefly for culinary purposes. The codlin ripens in summer or autumn, and can not be kept long.

Codling Moth, or **Codlin Moth**: the *Carpocapsa pomonella*, a small moth, the larva of which is one of the most important enemies of the fruit-grower. The larva is the well-known worm found feeding near the core of apples. The moth lays her eggs in the blossoms just as the petals fall, and the remedy is to spray the tree at this time with Paris green.

Cod-liver Oil (*Oleum morrhuæ*): an oil obtained from the cod (*Gadus morrhua*), in which the tissue containing the oil is almost entirely confined to the liver. Cod-liver oil is prepared in Great Britain, Newfoundland, and the U. S.,

but chiefly in the northern part of Norway. There are three varieties in the market—pale, pale-brown, and dark-brown oil.

Until the year 1853 cod-liver oil as a food and therapeutic agent was, in fact, no more than a crude product of domestic industry, difficult of ingestion, and not well supported by patients, who, indeed, would not have touched it had they known of the loathsome details of its preparation. Physicians, though in a measure aware of the objectionable features attendant upon its manufacture, and cognizant of its tendency to injurious decomposition, continued as a matter of necessity to prescribe it, while they were unable to employ it in those cases in which it was most needed—that is, for those conditions of phthisis and struma in which the digestive organs were in a supersensitive condition. Peter Möller, of Norway, took the manufacture of cod-liver oil out of the hands of the fishermen, and in 1853 he succeeded in introducing his celebrated steam process. In this process the livers are taken from the fish and treated as soon as possible after being received. Small, bruised, and diseased livers are rejected, and the selected livers are washed until free from blood, membrane, and other impurities. They are then minced to a pulpy mass, which is placed in an apparatus and heated externally by steam to the degree of 100° to 102° F. The oil as it exudes is drawn and filtered. Fresh livers and low temperatures give a pure, sweet, light, but brilliant amber-colored oil. Very pale or colorless oils are articles which have been subjected to deleterious bleaching processes. The darker oils prepared in the old way are now considered as unfit for therapeutic use. The light oil prepared by the Peter Möller process is not a refined product, but the pure, fresh oil, as it existed in the hepatic cells of the living fish.

The constitution of cod-liver oil has, ever since its appearance as a therapeutic remedy, been an object of curiosity to scientists, who, armed with the latest and best analytical weapons of chemistry, have tried to solve the mystery surrounding this valuable agent. The first chemical research on cod-liver oil dates as far back as the year 1828 by Wurzer (*Hufel Journ.*, 1832); the most elaborate work by later investigators was done by De Jongh in 1843 (*Disquisitio comparativa chemica medica de tribus olei jecoris aselli speciebus*, 1843). Among more recent workers may be mentioned Schafer (*Wigger's Jahresb.*, 1869); P. Charles (*Ph. Centralh.*, 1882); Kremel (*Ph. Centralb.*, 1884); Hager (*Ph. Centralh.*, 1885); Gautier and Morgues (*Les alcaloides de l'huile de foie de morue*, 1888). All these agreed that the main part (95–98 per cent.) of the oil consisted of the three glycerides, olein (about 70 per cent.), palmitin, and stearin (together about 25–28 per cent.). These compounds being the regular constituents of well-known fats, no importance was attached to them, but diligent search was made to find the active principle in the remaining part of the oil. A variety of things was thus found, one by one of them being in succession presented by their discoverers as the much-wanted panacea. Such was the state of affairs when P. Heyerdahl, Peter Möller's chemist, in 1891 succeeded in establishing the fact that the three above-named glycerides do not form the chief constituents of the oil, but, if present at all, they are so to a very limited extent. On the other hand, he found that the fats of the oil consist of some hitherto unknown glycerides. The acids of two of them he succeeded in presenting—one as a bromide, the other as a hydroxy acid. To the former he gave the name of therapic acid ($C_{17}H_{26}O_2$) and to the latter the name of jecoleic acid ($C_{19}H_{36}O_2$), each being presented in the oil to the extent of about 20 per cent. Therapic acid in the form of a glyceride is easily attacked by oxygen, forming hydroxy acids, which doubtless cause the well-known repeating after a dose of cod-liver oil, because this unpleasant effect does not appear after taking the oil never exposed to the action of air. The isolated acid is still less stable, so much so that it has hitherto frustrated all attempts to present it, no matter how carefully the experiments are made. As will be seen from the formula $C_{17}H_{26}O_2$, it is an unsaturated acid with four double bonds, consequently belonging to a series of organic acids, which has hitherto remained completely unknown, though the possibility of their existence has for a long time been theoretically maintained with much certainty. After Heyerdahl's discovery there can be no doubt that cod-liver oil owes its unsurpassed efficacy as a material for building up the human system to this acid, on account of the great ease with which it is broken up and adapted to the formation of those other compounds of which the organism in its expenditure and change of matter is constantly in want. The many and varied compounds which have been found in the rest of the oil and proclaimed as the active principle, such as gaduin, morrhuin, morrhuol, asellin, etc., are nothing but decomposition products formed during the process of analysis, or by living micro-organisms after the oil has left the hepatic cells. The jecoleic acid and one or two other acids, with one double linkage, have not yet been sufficiently examined, together with therapic acid—all of them in the form of glycerides make up the bulk of the oil, palmitic acid being present to the extent of about 5 per cent. Of stearic and oleic acid there is still less, if any at all. That part of the oil (2–5 per cent.) in which the active principle formerly used to be looked for consists of cholesterin, albumen, traces of iron, manganese, sodium, calcium, magnesium, phosphor, chlorine, bromine, iodine, coloring-matter (lipochrom), and some other not yet recognized compounds, probably decomposition products of the pure oil. From this it follows that cod-liver oil should be kept from any contact with the air until it is to be taken by the patient. It is commonly taken in doses of from a dessert-spoonful to a tablespoonful three times a day.

RASMUS B. ANDERSON.

Codman, JOHN, D. D.: Congregational divine; b. in Boston, Mass., Aug. 3, 1782; graduated at Harvard in 1802; studied in Edinburgh, and became pastor of a church at Dorchester, Mass., in 1808, and so remained till death. He was a prominent advocate of clerical education. He published many sermons, and bequeathed his large library to the Andover Seminary. D. in Dorchester, Dec. 23, 1847. See his *Memoir*, with six sermons, by Rev. Dr. William Allen (Boston, 1854).

Cod'rington, Sir EDWARD, G. C. B.: an English admiral; b. in Gloucestershire, Apr. 27, 1770. He served as captain of the Orion at Trafalgar in 1805, and became a vice-admiral in 1821. He commanded the English, French, and Russian fleets which defeated the Turks at Navarino in 1827, and was recalled on the pretext of having gone beyond his orders; became admiral in 1837. D. in London, Apr. 28, 1851.

Codrington, Sir WILLIAM JOHN, G. C. B.: general; a son of the preceding; b. in Nov., 1804; educated at Harrow and Sandhurst; entered the army in 1821; went with the Coldstream Guards to Bulgaria in 1854; was made major-general by brevet while at Varna, and distinguished himself both at the Alma and at Inkerman in 1854, and directed the attack on the Redan of Sebastopol in Sept., 1855. In November of the same year he became commander-in-chief of the army in the Crimea, a member of Parliament in 1857, and in 1859 governor of Gibraltar. In 1863 he was promoted to the rank of general, and in 1877 he was placed on the retired list. D. Aug. 8, 1884.

Co'drus (in Gr. Κόδρος): the last King of Athens; is supposed to have reigned about 1060 B. C. According to tradition, he sacrificed his life for his country during a war between the Athenians and the Dorians. An oracle having predicted that the people whose king was slain by the enemy should be victorious, Codrus went in disguise to the Dorian camp, and provoked a quarrel in which he was killed. His son Medon was then chosen archon of Athens. See ATHENS, ANCIENT.

Coefficient [from Lat. *co-* + *effi'ciens*, *-entis*, effecting a result, pres. ptc. of *effi'cere*]: in algebra, one of two simple or compound factors whose product constitutes a term. Thus in the term $2ab^2c$, $2ab^2$ is the coefficient of c, $2a$ of b^2c, and 2 of ab^2c. In the latter case 2 is frequently called the "numerical coefficient" of the term, the others being distinguished as "literal coefficients." In an algebraical expression, and especially in quantities whose terms involve constant as well as variable factors, it is usual to restrict the term "coefficient" to the former.

Coehorn, kō'horn: so named from Baron van Coehorn, who invented it; a small mortar, frequently a 24-pounder. Coehorns, being easily moved and taking little powder, are found very useful in sieges, if grouped in great numbers. They are generally made of bronze.

Coehorn, koo'hōrn, Lieut.-Gen. MENNO, Baron van: Dutch military engineer; a contemporary and opponent of Vauban; b. near Leeuwarden, Friesland, 1641; received from his father, a captain of infantry, his first lessons in the art of war; early showed talent for the construction of fortifications; studied at Franeker; captain in the Dutch service

at the age of sixteen; became famous by the invention and use of the small mortar that bears his name at the siege of Maestricht 1674; colonel 1674; brigadier-general 1688; distinguished himself at Fleurus and in the defense of Namur against Vauban; introduced the bayonet among the Dutch infantry about 1680; built numerous fortifications on a plan which was a modification of the bastioned system adapted especially to the flat surface of Holland (see FORTIFICATIONS); retook Namur 1695; as lieutenant-general of engineers had charge of all the fortresses of Holland; commanded a corps in the war of the Spanish Succession, and distinguished himself by the capture of Bonn and numerous other important posts; had been summoned to The Hague to consult with Marlborough on the plan of campaign, when he died on the way from a stroke of apoplexy, Mar. 17, 1704. Coehorn's genius has been universally recognized. Zastrow called him "the prince of engineers," and Vauban himself urged Louis XIV. to offer him inducements to enter the French service. See *Life of Coehorn*, by J. Watts de Peyster. C. K. ADAMS.

Coel, or **Koel**: See ALIGARH.

Cœlentera'ta [Gr. κοῖλος, hollow + ἔντερα, intestines]: a class of animals formerly included in Cuvier's unnatural group *Radiata*. The Cœlenterates are sac-like animals with no distinction between digestive and body cavities; with but a single opening for the ingestion of food and the voidance of rejectamenta. The body-wall consists of but two germ layers, ectoderm and entoderm (see EMBRYOLOGY), with occasionally a gelatinous layer of considerable thickness between them. From the ectoderm are developed muscles, nerve centers, and sense organs; the inner layer is more adapted for digestive and excretory purposes. A peculiarity of both layers is the formation of thread-cells or nettle-cells (whence the name acalephs, from Gr. ἀκαλήφη, a nettle, formerly given to the medusæ), which are used as a means of defense and for killing the prey. These thread-cells are sacs filled with a poisonous fluid, and provided with a long hollow thread through which upon irritation the poison can be conveyed into the tissues of other animals. The larger forms, like the Portuguese man-of-war, produce severe effects upon the human flesh, but the smaller ones usually are without effect on man. Most of the Cœlenterates are marine, a few only occurring in fresh water. Some (the jellyfish or medusæ) are free swimming, others (sea-anemones, corals, hydroids) are fastened to some object during their mature life.

The Cœlenterates afford some interesting instances of ALTERNATION OF GENERATIONS (*q. v.*). Thus many common hydroids which are attached to plant-like forms produce reproductive buds from which at maturity there escape jellyfishes or medusæ, which bear only a remote resemblance to the parent and which swim freely through the water. These medusæ in turn produce eggs from which other hydroids like the grandparent are produced, thus completing the cycle. In some instances the process is even more complicated.

The Cœlenterates are divided into two sub-classes, the Hydrozoa, in which the throat is lined with entoderm, and the Scyphozoa, in which the throat is lined with ectoderm. In both groups there are several parallels. Thus in both we have fixed forms and free-swimming jellyfishes; both reproduce by eggs and by budding, both have alternations of generations, and some members of each produce the hard calcareous substance known as CORAL (*q. v.*). The Hydrozoa are divided into *Hydromedusæ* (see HYDROID) and *Siphonophoræ* (*q. v.*). The *Scyphozoa* are divided into *Scyphomedusæ* (see MEDUSÆ) and *Actinozoa* (see POLYP). The Ctenophores (comb-bearing jellyfishes) are now not regarded as true Cœlenterates, and are given a separate article.

In general words, it may be said that the Cœlenterates lack many characters which are commonly but erroneously regarded as characteristic of animals. Thus there is no brain, but the deeper portion of the skin performs functions as a nervous system. There is no heart, nor excretory system, and blood-vessels are wanting. That they are true animals is beyond a doubt. They have eyes and ears, muscles, a stomach, and reproduce by eggs. J. S. KINGSLEY.

Cœlestine: See CELESTINE.

Cœ'le-Syria (in Gr. ἡ κοίλη Συρία, the hollow Syria): a beautiful valley of Syria between the mountain-ranges of Lebanon and Anti-Lebanon: about 90 miles long, and of an average width of 7 miles, but in some parts its breadth is far greater. It is now called El Bukaa. It is intersected by the river Litany (anc. *Leontes*). The chief city of Cœle-Syria was Baalbec (*Heliopolis*).

Coelho, kō-āl'yō, DUARTE DE ALBUQUERQUE: eldest son of Duarte Coelho Pereira; b. at Olinda, Pernambuco, in 1537. By the death of his father in 1554 he inherited the captaincy of Pernambuco as second donatario. He was at that time in Europe, where he had been sent for his education, and the captaincy was governed *ad interim* by his mother; returning in 1558, he governed the captaincy personally until 1577, when he went to Portugal to join in the invasion of Africa under Dom Sebastião. At the battle of Alcacer-Quivir (Aug. 4, 1578) he was taken prisoner by the Moors, and died in captivity, probably in 1579. HERBERT H. SMITH.

Coelho, DUARTE DE ALBUQUERQUE: son of Jorge de Albuquerque Coelho, Marquis of Basto and Count of Pernambuco; b. in Lisbon, Dec. 22, 1591. He inherited the captaincy of Pernambuco, and governed it personally from 1627 until driven out by the Dutch invasion. In the subsequent struggles with the Dutch he did good service, especially distinguishing himself in the defense of Bahia in 1638. At the separation of Portugal from Spain he remained faithful to the Spanish king, and was gentleman of the bedchamber to Philip IV. He published in 1654 his *Memorias diarias de la guerra del Brazil*, an account of the wars in Brazil from 1630 to 1639, of great historical value. D. in Madrid, Sept. 24, 1658. HERBERT H. SMITH.

Coelho, FRANCISCO ADOLPHO: Portuguese philologist and educator; b. at Coimbra in 1847; since 1878 Professor of Comparative Philology in Lisbon. Among his more important works are *A Lingua Portugueza* (1868); *Origem da lingua portugueza* (1870); *Os dialectos romanicos, ou neolatinos na Africa* (1881). His *Contos populares portuguezes* (1879) was the first important collection of Portuguese popular tales. One or two of Coelho's books upon education are important: *A questão do ensino*; *Bibliotheca d'educação nacional* (3 vols., 1882, *seq.*). Since 1875 he has edited with Braga and Vasconcellos a review entitled *Bibliographia critica de Historia e Litteratura*; also, since 1880, a *Rivista d'Ethnologia e de Glottologia*.

A. R. MARSH.

Coelho, GONÇALO, or GONZALO: Portuguese navigator, who in 1488 commanded a ship on the coast of Senegambia, bringing a Negro chief or "king" prisoner to Lisbon. Later he was sent by the king, with six caravels, to seek a route to the Moluccas to the S. of the newly discovered "land of Santa Cruz" (Brazil). Amerigo Vespucci was captain or pilot of one of the caravels. They left Lisbon on June 10, 1503, and reached the island of Fernando de Noronha in safety. Soon after the ship in which Coelho sailed was wrecked, and he had to take refuge in one of the others. Two other ships, including that of Vespucci, separated from him and returned to Lisbon in 1504. Coelho, with the remaining ships, explored as far S. at least as Rio de Janeiro, and only returned in 1506. The historian Porto Seguro believes, with much reason, that Coelho formed a regular settlement on the site of Rio de Janeiro, and that one of his ships, sent to explore southward, attained the Rio de la Plata. Beyond the voyages mentioned nothing is known of Coelho's life. There is no proof that he had commanded the previous expedition of 1501 to the Brazilian coast, though he may have accompanied it. HERBERT H. SMITH.

Coelho, JORGE DE ALBUQUERQUE: a Portuguese soldier; second son of Duarte Coelho Pereira; b. at Olinda, Pernambuco, Apr. 29, 1539. He was early sent to Europe, returned in 1558, and his brother, who had inherited the captaincy, gave him command of the little army of the colonists. At the head of this he routed the hostile Cahatés Indians, and pushed far into the interior, exploring the river San Francisco for several hundred miles. Going to Portugal in 1565, he was captured on the way by French corsairs, who plundered his ship and then abandoned it, leaving him and his companions almost without provisions and exposed to a terrible storm. They reached Portugal only after great suffering. In 1578 he and his brother followed the king, Dom Sebastião, to Africa, and both were captured at the disastrous battle of Alcacer-Quivir, where the king was killed. Jorge Coelho was ransomed two or three years after. His brother having died in captivity without leaving children, he was now hereditary ruler of Pernambuco; but his fortune had been exhausted by the Moorish wars and in paying his ransom, and he was unable to bear the expenses of the colony, or even to return to it. He wrote several memoirs

on the wars of Brazil, which apparently were never published, but were used by contemporary historians. D. in Lisbon some time after 1596. HERBERT H. SMITH.

Coelho Pereira, DUARTE: Portuguese soldier and statesman; b. about 1485. He early entered the service of the king, and was sent to the East Indies, where he distinguished himself in various land and naval actions; he discovered Cochin China, and visited Siam and China as ambassador of the Portuguese. Returning to Portugal in 1527, he married a sister of Jeronymo de Albuquerque. In 1530 he cruised on the coast of Brazil, where he destroyed a French trading-colony which had been established near the present site of Pernambuco, and routed the Potiguares Indians, allies of the French. In Apr., 1534, he was granted the captaincy of Pernambuco, then established in perpetuity, and in 1535 he took possession and founded Olinda, at the mouth of the harbor of Pernambuco; this was long the capital and most important city, not only of Pernambuco, but of all Northern Brazil. The infant colony had to sustain a war with the savage Cahatés Indians, but these were beaten by the aid of the friendly Tabayres, and in a few years Pernambuco was the most flourishing captaincy of Brazil. Coelho from the first avoided wild enterprises, concentrated the strength of his colony, and encouraged agriculture. D. at Olinda, Aug. 7, 1554. HERBERT H. SMITH.

Cœ'lius, LU'CIUS CŒ'LIUS ANTI'PATER (also spelt **Cælius**): a Roman historian of the second century B. C., who composed a history of the second Punic war in seven books. He paid more attention to style than his predecessors, and dedicated his work to L. Ælius Stilo, the famous grammarian. Livy, Plutarch, and other writers used him as a source. For the extant fragments, see Peter's *Historicorum Romanorum Fragmenta* (Leipzig, 1883, pp. 98–108).

Cœlom [from Gr. *κοίλωμα*, a hollow, from *κοῖλος*, hollow]: in anatomy, the primitive body-cavity of animals above the Cœlenterates and Platyhelminthes. It arises in various ways, but in all it is distinct from the digestive tract, and is lined with epithelium. (See HISTOLOGY.) In the higher forms portions have different fates, but in all vertebrates the major portion is known as the pleuro-peritoneal cavity.

J. S. K.

Cœn'obites, or **Synodites** [*cœnobite* is from Eccles. Lat. *cœnobi'ta*, deriv. of *cœnobium*, monastery = Gr. *κοινόβιον*, community life; *κοινός*, common + *βίος*, life; *synodites* is from same source as SYNOD (*q. v.*)]: those ascetics who lived in communities instead of alone as did the anchorites or hermits. Pachomius of Egypt first founded a cœnobium in the fourth century. Basil, Benedict, and Jerome express decided preference for communal life, and it became the rule in Western monachism. Female cœnobia may have preceded the male as more necessary.

Cœur d'Alène Indians: See SALISHAN INDIANS.

Coevius, JACOB: See RAABE, WILHELM.

Coeymans, kwee'manz: town (founded in 1640); Albany co., N. Y. (for location, see map of New York, ref. 5–J); on West Shore R. R. and on the Hudson river; 12 miles from Albany; has a mineral spring, flagstone quarries, brickworks, an iron foundry, etc.; graded schools, four churches, and a weekly newspaper. Pop. of township (1880) 2,912; (1890) 3,669; (1900) 3,952. EDITORS OF "HERALD."

Coffee [Fr., Span., and Portng. *café*; Ital. *caffé*; Germ. *kaffee*; etc. First used in the seventeenth century]: (1) the berries of *Caffea arabica*, a tree which when wild reaches a height of 10 to 30 feet, and bears but few branches; and (2) a beverage made from these berries after roasting and grinding. The tree grows wild in Central Africa and in Mozambique, and originally was a native of Abyssinia and Arabia.

It was first cultivated in Java during the seventeenth century, and later in the West Indies and South America. The tree is at present cultivated in nearly all the tropical and sub-tropical countries of the world. A distinct species of coffee-plant is the so-called Liberian coffee-plant, which seems to be more hardy than the *Caffea arabica* and therefore more easily cultivated.

Most of the coffee of commerce comes from coffee-plantations which are laid out in quadrangles, the ground in which they grow being kept well weeded. When cultivated the tree is very frequently pruned, so that it is only 6 to 10 feet in height, while its branches almost touch the ground. The leaves of the coffee-tree are oblong, and 3 to 5 inches in length, leathery and shiny, while the flowers are snow-white, exceedingly fragrant and small, being clustered in the axiles of the leaves. It has a succulent fruit which, when it is ripe, is of a dark-red color, and which contains two cells, each of which contains a single seed. These seeds are hard, semi-ellipses, and form what is known in commerce as coffee-nibs, coffee-berries, or coffee-beans.

There are a number of species of coffee which vary in their characteristics according to the portion of the world in which they are grown. One of the most noteworthy of the various varieties of coffee is that which is known as Mocha, which comes from Arabia, and which many persons think is superior to any other form. Mocha coffee-beans occur as small greenish-gray masses of the shape first described. The Java or East Indian beans are large and yellow and the Jamaica smaller and of a greenish tint.

These berries when they are roasted develop an empyreumatic oil which is known as caffeol or caffeone, and when ground into a powder of varying coarseness are used for the purpose of making the beverage which is called "coffee," in which the active principles of the coffee—namely, the empyreumatic oil and the alkaloid caffeine—produce a characteristic and agreeable flavor, and provides the person that drinks the beverage with a powerful nervous, circulatory, and respiratory stimulant. Coffee has been in general use as a beverage for about 300 years.

Aside from its effects as an oil caffeol, the empyreumatic oil of coffee, possesses no known influence upon the animal economy, according to the investigations of Reichert, Marshall, and Harc.

Caffeine, the alkaloid of coffee, is employed in medicine both as caffeine and as citrated caffeine, being soluble in about 75 parts of water. It is to be noted that citrated caffeine is not the citrate of caffeine, for chemists do not consider that a definite chemical compound is formed between caffeine and citric acid.

When taken internally, coffee, or its alkaloid caffeine, produces a rapidly stimulating effect, which is chiefly exerted upon the intellectual portions of the brain and the reflex tracts of the spinal cord. As a result of this, it produces a marked increase in the rapidity of thought, and enables the individual who takes it to do more intellectual work in a given space of time than he could do otherwise, but this is always accomplished at the expense of nervous energy. A period of reaction is very apt to follow its use, and ultimately a brain driven along by caffeine breaks down, or at least is incapable of doing as much good work as before coffee or caffeine were resorted to. Coffee also stimulates the heart-muscle and the general circulatory system. The kidneys under its influence are also stimulated, and both the liquids and solids of the urine are increased in quantity. At the same time it diminishes the waste of tissues. The empyreumatic oil of which we have spoken is probably the cause of the "biliousness," so called, which is produced by coffee-drinking in some persons. As much as from 20 to 30 minims of this oil is present in an ordinary cup of strong coffee. Either when in the form of a beverage coffee is prepared in such a way as to be exceedingly black and strong, or as caffeine, it is exceedingly useful in many cases of heart and kidney disease, and is of the utmost value in the treatment of opium-poisoning. Sometimes when too much caffeine is given for a considerable period of time as a medicament, it causes so much nervous excitement as to produce delirium.

Caffeine is an alkaloid which is closely allied to guaranine, theine, and theobromine, and it is stated on good authority that most of the so-called caffeine of commerce is in reality theine derived from damaged tea, as this source is a much cheaper one than coffee. It is worthy of note that while coffee is more apt to produce biliousness than is tea, tea, on the other hand, is more apt to produce constipation, because of the tannic acid which it contains.

Unfortunately, a number of substances in powdered form have been introduced into commerce as adulterants of this valuable substance, notably chicory root, barley seeds, buckwheat, rye, and dandelion root, and sometimes charred bread crusts are employed. It is unnecessary to state that these adulterant substances are not only fraudulent, but that in all instances they lack the active principles of coffee. See the article ADULTERATION.

It is said that in Sumatra the leaves of the trees are used instead of the seeds in preparing a drink. Not only have coffee-leaves been employed as a substitute for the ordinary coffee of commerce, but in addition the pericarp of coffee-fruit has been recommended as a substitute. It is free

from caffeine, and therefore fails to produce the stimulant influence of that drug, but the pericarp of the seed or husks do contain small quantities of caffeine, and have been employed for the purpose of improving the flavor of the coffee-berries themselves. Such a coffee is known as Sultan or Sacca coffee.

The object of roasting coffee is to render the seeds more readily pulverizable, and to develop the peculiar aroma and taste which is due to the presence of an empyreumatic oil, of which we have spoken. The seeds under these circumstances become a chestnut brown, and lose about 18 per cent. of their weight. H. A. Hare.

Coffee-houses (in Fr. *café*): houses or saloons where coffee and other refreshments are served out to customers. Coffee houses were established at Constantinople in 1554, in London in 1652, and at Paris in 1662. For many years the use of coffee and the frequenting of coffee-houses were assailed by various writers. Before the general introduction of newspapers, coffee-houses were, particularly in England, important centers or sources of information, where people assembled to learn the news and discuss politics. See Clubs.

Coffer: a casket for keeping jewels, money, etc. In architecture this term is applied to the sunken panels in vaults and domes, or to deep panels in ceilings. In fortification, coffer is a particular kind of caponnière.

Cofferdam [*coffer*, a strong box; from O. Fr. *cofre*: Ital. *cofano* < Lat. *cophinus* = Gr. *κόφινος*, basket]: in civil engineering, a watertight inclosure for laying the foundation of bridge-piers, dams, wharves, etc. Cofferdams are often constructed of piles in two rows, with clay packed between. When finished, the water is pumped out by steam-power. Where the water is too deep for cofferdams, various forms of the Caisson (*q. v.*) are used; in which case the pier is sometimes gradually lowered to the bottom of the stream. See Foundation.

Cof'feyville: city and railroad center; Montgomery co., Kan. (for location of county, see map of Kansas, ref. 8–I); on Mo., Pac., Atch., Top. and Santa Fé and other R. Rs., and on the Verdigris river. There are here five natural gas-wells. The city draws a large trade from Indian Territory. Pop. (1880) 753; (1890) 2,282; (1900) 4,953.

Editor of "Journal."

Coffin [viâ Fr. from Lat. *cophinus* = Gr. *κόφινος*, basket; *coffin* and *coffer* are doublets]: a box intended to contain a corpse for burial. Among peoples who do not burn their dead there is a general disposition to keep the body inclosed and separate, instead of allowing it to pass at once into the earth as common sense and the laws of health would dictate. The Egyptian practice of embalming the dead had, however, a different origin. (See Egypt: *Future Life.*) The Egyptian coffins were commonly made of wood and often richly painted; they are commonly called mummy-cases. Stone coffins were also used by the Egyptians, and in this they were imitated by the Roman artists of the empire (cf. Sarcophagus); and the bodies of persons of high rank are often found in stone coffins in more recent times. Thus many of the ornamental sarcophagi forming part of Italian tombs of the fifteenth and sixteenth centuries actually contained the bodies of the persons commemorated. Modern coffins have generally been of the familiar "coffin-shape," until in very recent times a desire to make the associations less gloomy has caused the introduction of coffins with straight parallel sides, often called caskets.

Coffin, Charles: poet; b. at Buzancy, department of Ardennes, France, 1676; d. in Paris, June 20, 1749. He was educated in the Collège Duplessis, Paris, and was in 1701 appointed assistant, and in 1712 principal, of Collège Dormans-Beauvais, which position he held to his death. He cultivated Latin poetry with great success. In his earlier days he wrote convivial songs, and his *Ode to Champagne* became very popular, and every year brought him a basket of that costly wine from the wine-merchants of Rheims. When he grew older he wrote hymns, and several of those Latin hymns which he contributed to the Paris Breviary are found in English collections in John Mason Neale's and John Chandler's translations. His works appeared in Paris, 1755, 2 vols.

Coffin, Charles Carleton: journalist and lecturer; b. in Boscawen, N. H., July 26, 1823. During the civil war he was war-correspondent of the *Boston Journal*. Among his books are *Days and Nights on the Battle-field* (1864); *Four Years of Fighting* (1866); *Boys of '76* (New York, 1879); *Story of Liberty* (1878); *Old Times in the Colonies* (1880); *Building of the Nation* (1883); *Marching to Victory* (1888); *Freedom Triumphant* (1891). D. Mar. 2, 1896.

Coffin, Admiral Sir Isaac, Bart.: b. in Boston, Mass., of a Nantucket family, May 16, 1759. His father was a Tory, and collector of the port of Boston. Young Coffin entered the navy in 1773, serving against the U. S. in the Revolutionary war. He had, however, throughout life a strong regard for his native land. He was rapidly promoted, and attained in 1830 the rank of admiral of the white. In 1826 he visited Nantucket, where he founded and endowed the Coffin School. D. July 23, 1839.

Coffin, John: inventor; b. at Chatham, N. Y., Sept. 18, 1856; was foreman at the Cambria iron-works, Johnstown, Pa., but died early from typhoid fever, Sept. 3, 1889. He discovered two singular properties of steel: the welding of surfaces at a temperature lower than carbon changes can occur, and the yielding of steel by its own weight at that temperature. See *Trans. Am. Soc. Mech. Eng.*, vol. xii.

C. H. T.

Coffin, John Huntington Crane, LL. D.: b. in Wiscasset, Me., Sept. 15, 1815; graduated at Bowdoin College 1834; in 1836 was appointed Professor of Mathematics in the U. S. navy. He served at sea and in nautical surveys, was detailed in 1844 for duty at the Naval Observatory, and prepared descriptions and discussions of the work with the mural circle in the *Washington Observations* (1846–49), and a great part of those for 1845. He published also a discussion of the personal equation in bisecting a star by a micrometer thread (*Astronomical Journal*, iii., p. 121). He was Professor of Mathematics or Professor of Astronomy and Navigation in the U. S. Naval Academy (1853–65), and from 1866 in charge of the preparation of the *American Ephemeris and Nautical Almanac*. D. Jan. 8, 1890.

Coffin, Joshua: genealogist; b. at Newbury, Mass., Oct. 12, 1792; graduated at Dartmouth in 1817; was a teacher of the poet Whittier, and published *The History of Ancient Newbury* (1845), and numerous papers, etc., upon family genealogies. D. in Newbury, June 24, 1864.

Coffin, William Anderson: landscape and figure painter; b. in Allegheny City, Pa., Jan. 31, 1855. Pupil of Bonnat, Paris; second Hallgarten prize, National Academy, New York, 1886; third-class medal, Paris Exposition, 1889; Webb prize for landscape, Society of American Artists, 1891; member Society of American Artists (1886) and of Architectural League, New York. His picture *The Rain* (1891) is in the Metropolitan Museum, New York. He graduated from Yale College in the class of 1874, studied a year in the art school connected with the university 1875-76, and went to Paris in 1877. Principal works: *Mandolin Player* (1881); *An Examination* (1882); *Close of Day* (1883); *Moonlight in Harvest* (1886); *Early Moonrise* (1888); *September Breeze* (1889); *A Pennsylvania Farm—after the Thunder-shower* (1890); and *Evening* (1892).

Coffinhal, kō'fĕĕ'naal', Jean Baptiste: one of the most atrocious characters of the French Revolution; b. at Aurillac, in the department of Cantal, France, 1754; d. in Paris, 1794. He studied first medicine, afterward law, and was practicing in Paris when the Revolution broke out. He embraced the new ideas with fanaticism, acted for some time as president of the Jacobin Club, and was in 1792 appointed first justice, then vice-president, of the revolutionary tribunal. Some of the most odious verdicts of that tribunal must be laid to his charge. When Lavoisier asked for a respite of some days in order to complete a chemical discovery he had made, Coffinhal answered him: "The republic has no more use for any chemists." As an adherent of Robespierre he was implicated in his fall. He succeeded in escaping, but was delivered up to the police by a friend.

Coghetti, kō-get'tĕĕ, Francesco: an Italian painter; b. at Bergamo, Oct. 4, 1804; produced powerful fresco-paintings for several Roman palaces. He made a long study of Raphael, and founded an excellent school, marked by a serious study of the masters. His *Condemnation of St. Stephen* procured for him an order of knighthood. D. at Rome, Apr. 21, 1875.

Cognac, kōn'yaak' (anc. *Condate*; Modern Lat. *Conacum*): a town of France; department of Charente; on the river Charente; 24 miles W. of Angoulême (see map of France, ref. 6–D). It has an old castle, in which Francis I. was born. In 1526 an alliance of France, England, the pope, Milan, and Venice, against Charles V. was concluded here. Brandy of

excellent quality is made here, and is the chief article of export. About 6,000 butts of Cognac brandy are produced annually. Pop. (1896) 20,228.

Cogniet, kōn'yi-ā', Léon: historical and portrait painter; b. in Paris, Aug. 29, 1794; d. there Nov. 20, 1880; pupil of Guerin; Grand Prix de Rome 1817; first-class medal, Paris Exposition, 1855; officer Legion of Honor 1846; member of the Institute 1849. He was the master of many of the most distinguished artists of the present French school. His work is academic in style, but shows realistic tendencies. His *Magdalen* is in the Church of the Madeleine, Paris.

W. A. C.

Cognizance [M. Eng. *conisance* = O. Fr. *conissance*: Ital. *conoscenza* < Lat. **cognoscentia*, deriv. of *cognos'cere*, know]: in general, knowledge or notice. Specifically: (*a*) In law, authoritative notice or recognition, as of a fact; jurisdiction over or legal power to determine a particular cause or suit; also an acknowledgment or submission, as in pleading. (*b*) Badge worn by a retainer or dependent to indicate the party or person to which he belongs: also, in heraldry, cognizance is a crest, coat-of-arms, or similar badge of distinction.

Revised by F. Sturges Allen.

Cogno'men: a Latin word signifying a surname; the last of the three names usually borne by ancient Romans of good family. Cicero, for example, was the *cognomen* of the great orator, Marcus Tullius Cicero. It served to designate the family (*familia*) to which he belonged, as the other two names—viz., the *prænomen* and the *nomen*—served respectively to denote the individual and the class (*gens*) to which his family belonged.

Cogno'vit Actio'nem [Lat., he has recognized the action]: in common law pleading, a confession of a defendant subscribed by him or his atttorney, giving authority to a plaintiff to enter up judgment against him. It is executed after an action has been commenced, and is supposed to be given in court. In Great Britain the subject is regulated by statutes protecting the interests of the defendant, and in some of the U. S. there has been provided by statute a convenient substitute for a *cognovit*, in which, upon written offer by the defendant and acceptance by the plaintiff in a prescribed manner, judgment may be entered accordingly. It is distinguished from a Warrant (*Warrant of Attorney*) (*q. v.*).

Revised by F. Sturges Allen.

Cogre'dients [from Lat. *co-*, together + *-gre'diens*, form in compp. for *gra'diens*, proceeding, ptc. of *gradi*: things meeting together or agreeing. In mathematics, two sets of facients or variables, each set containing the same number, are said to be cogredient if on replacing the variables of the first set by certain linear functions of themselves those of the second set become also replaced by the same linear functions of themselves.

Cogswell, Jonathan, D. D.: a Calvinistic divine; b. in Rowley, Mass., Sept. 3, 1782; graduated at Harvard in 1806; was a tutor in Bowdoin College 1807–09; studied theology at Andover 1809; pastor at Saco, Me., 1810–28, and at New Britain, Conn., 1829–34; Professor of Ecclesiastical History in the Theological Institution at East Windsor, Conn. (1834–44), and lived without charge afterward. He published *The Hebrew Theocracy* (1848); *Calvary and Sinai* (1852); and other works. D. at New Brunswick, N. J., Aug. 1, 1864.

Cogswell, Joseph Green, LL. D.: scientist and librarian; b. at Ipswich, Mass., Sept. 27, 1786; graduated at Harvard in 1806; visited the East Indies; after his return studied law, and became a tutor in Harvard in 1814. He afterward studied in Europe, and became a librarian and Professor of Mineralogy at Harvard (1820–23). With the historian Bancroft he founded the celebrated Round Hill School at Northampton, Mass. He was superintendent of the Astor Library 1848–60, where his bibliographical work was of prime importance in library organization in the U. S. He contributed much excellent matter to periodical literature, and enriched the botanical and mineralogical collections at Harvard University with thousands of European specimens. D. at Cambridge, Mass., Nov. 26, 1871.

Cogswell, Mason Fitch, M. D.: b. at Canterbury, Conn., in 1761; graduated at Yale in 1780; became an eminent surgeon of Hartford, Conn., and was one of the founders of the asylums at Hartford for the deaf and dumb and for the insane. D. in Dec., 1830.

Cogswell, William, D. D.: a Congregational divine; b. in Atkinson, N. H., June 5, 1787; graduated at Dartmouth in 1811; became general agent of the American Education Society in 1829; Professor of History at Dartmouth (1841); Professor of Theology and president of Gilmanton Theological Seminary in New Hampshire (1844); was the author of works on theology, etc. D. in Gilmanton, N. H., Apr. 18, 1850.

Cohesion [from Lat. *cohære're*, cohere; *co-*, together + *hære're*, stick]: in natural philosophy, the force by which the particles of homogeneous bodies are kept attached to each other, and with which they resist separation. Adhesion denotes the attractive force existing between two different bodies brought into contact, as a drop of water on a plate of glass; or between two bodies of the same matter, as two lumps of lead when their smooth surfaces have been pressed together.

Cohn, Ferdinand Julius: German botanist; b. in Breslau, Jan. 24, 1828; Professor of Botany in the University of Breslau. Has made many investigations, especially relating to the structure and life-history of the fungi. Of his numerous published works the following may be mentioned: *Ueber Bacterien* (1872); *Kryptogamen-Flora von Schlesien* (1877–89); *Die Pflanze* (1882).

Charles E. Bessey.

Cohoes, kō-hōz': a city and railroad center of Albany co., N. Y. (for location of county, see map of New York, ref. 5–J); on the right bank of the Mohawk river, at its junction with the Hudson river; on the Erie and Champlain Canals, 9 miles N. of Albany. It has 3 ax-factories, several cotton-mills (one of which is one of the largest in the world), 40 knitting-mills, 2 spring knitting-needle factories, a pipe manufactory, a rolling-mill, and electric street railways connecting it with suburban towns, and a horse-railroad connecting with the city of Troy, 3 miles S. The city receives its supply of water for all purposes from the Mohawk river. The Cohoes Falls are in the city limits. Pop. (1880) 19,416; (1890) 22,509; (1900) 23,910.

Editor of "Dispatch."

Co'hort [from Lat. *cohors*, *-ortis*, inclosure, one-tenth of a legion; *co-*, together + *hortus*, inclosure]: in the armies of ancient Rome, the tenth part of a legion, and consisted usually of 600 men. The prætorian cohort was a body of picked troops who attended the commander of the army, and at a later period formed the guard of the emperor.

The term "cohort" is applied by some botanists to groups or assemblages of natural orders.

Coimbatore: a district of British India; presidency of Madras; bounded N. by Mysore, E. by the river Cauveri, which separates it from the district of Salem, S. by the states of Madura and Travancore, and W. by the state of Cochin, the district of Malabar, and the Nilgherri Hills. It is a flat, open country about 900 feet above the level of the sea, surrounded N., W., and S. by mountains rising 9,000 feet, but opening eastward into the plains of the Carnatic. The principal rivers are the Cauveri, Bháwani, Noyel, and Amarawati, from which numerous canals have been cut in all directions for the purpose of artificial irrigation. Of the total area (7,842 sq. miles), 3,877½ sq. miles, or 2,488,000 acres, are reported as being under cultivation. Excellent cotton and tobacco and good crops of grain, oil-seeds, and fruit are raised. Extensive teak-forests are found. Pop. 1,657,690, nearly all Hindus. The district of Coimbatore was acquired by the British in 1799, when the war closed, after the death of Tippu. Capital, Coimbatore. Pop. (1891) 46,383.

Coimbra, kō-eem'braă (anc. *Comembrica*): a city of Portugal; capital of the province of Beira; on the river Mondego; 115 miles N. N. E. of Lisbon (see map of Spain, etc., ref. 15–A). It is built on rising ground, and seen from a distance has an imposing aspect, but the streets are narrow and the houses mean. Coimbra derives its importance from its university, the only one in Portugal. It was founded in 1291, but at Lisbon, and not finally established at Coimbra until 1527. It has a library of 84,000 volumes, and in 1892 had 1,166 students and 74 professors. It also has a military college, a royal college of arts, and a botanic garden. There are several fine churches; also manufactures of linen and woolen fabrics, pottery, articles of horn, etc. Coimbra was founded by the Goths, and afterward occupied by the Moors, from which it was taken by Ferdinand I. of Castile in 1064. It became the capital of Portugal in 1139 and continued so until 1422. Pop. (1890) 17,329.

Coimbra: a Brazilian fort and settlement; on the right bank of the river Paraguay, at lat. 19° 55′ S. The river is

here narrowed by two opposing hills, and the point has long been regarded as the key to the navigation of the upper Paraguay. The fort was founded in 1775, and, as the navigation of the lower Paraguay was closed to the Portuguese, heavy cannon were brought up the Amazon, Madeira, and Gnapure, thence dragged overland to the Paraguay, and floated down to Coimbra. The Spaniards attacked the fort in 1801, but were repulsed; in Dec., 1864, it was taken by the Paraguayans. About a mile above Coimbra there is a remarkable and very large cavern, the Gruta do Inferno.

HERBERT H. SMITH.

Coin, kō-een′: a town of Spain; province of Malaga; about 22 miles W. of Malaga (see map of Spain, ref. 20–E). It has an episcopal palace and several convents; also fine public walks and gardens in the environs. Here are manufactures of linen and woolen fabrics, paper, and soap. Pop. 1887) 9,825.

Coinage: 1. The art, act, or practice of stamping metallic money. 2. Coin, coined money; a piece of metal of a certain weight and fineness issued as a measure of value and instrument of exchange by the government and bearing its authorized stamp. See MINT, MONEY, NUMISMATICS, and WEIGHTS AND MEASURES.

Before the invention of the art of coining, traffic consisted of barter. Among pastoral people values were estimated in the produce of the land. This practice gave way to the use of different kinds of metals, definite quantities of which by weight passed as measures of value of commodities, such as oxen and sheep. Hence the names early given to money: e. g. the Latin *pecunia*, from *pecus*; the English "fee," from the same root as the German *Vieh*; and the Indian *rupee*, from the Sanskrit *rupa*, all meaning "cattle." So, too, with the shekel of the Book of Job, there called *kesitah*, and rendered by the interpreters as "lamb."

The art of coining was practiced in Lydia in the time of Gyges and in the Peloponnesus in the reign of Phidon of Argos, but from the earliest times it has been a question as to priority of invention between Asia Minor and the ancient Greeks. The system of weights used in both coinages is supposed to be of Assyrio-Babylonic origin, and to have been transmitted to the shores of the Ægean Sea by the early Phœnician traders by sea and land. The scale of ancient coinage weights is believed to have been further transmitted from Peloponnesus to Italy, Spain, Gaul, and Britain, and thus to have been the derivation of later systems of weights.

The coinage of William the Conqueror was derived from the Romans, the same as that of Charlemagne in France. The measure of value throughout Western Europe was the Roman pound weight of silver bullion, and known in England as the Troy pound of 12 oz. This was originally divided into 240 coins called pence (*denarii*), 12 of which were called a shilling (*solidus*). The solidi, or 20 shillings, therefore, actually weighed a pound of silver bullion. Down to the time of George IV. numerous alterations of the coinage took place in England; so that the pound of silver in coin came to be much less than a pound of metal in bullion, until in the time of Elizabeth the pound weight was coined into 744 pence, or 62 shillings, representing the nominal value of £3 2*s*. In Scotland the depreciation of the coinage proceeded to much greater lengths, and still further in France and Italy. The French *livre* has dwindled to a *franc*, the basis of the modern metrical system of coinage, and the original *solidus* to a *sou*.

Gold coinage was first successfully introduced into England by Edward III., but it was not until the reign of Charles II. that the quantity of gold coin was sufficient to prevent its disappearance from circulation. Then gold from the Guinea coast of Africa was coined into pounds sterling or guineas intended to be of the value of 20*s*. in silver. Disagreement between mint rating and market value of gold and silver and debasement of the silver coinage caused guineas to rise in value and to disappear from circulation. Though partially rectified by the recoinage of 1697, it was not till 1717 that the value of the guinea was settled at 21*s*., or 4*d*. above the parity as determined by Newton, when gold was fixed at the mint price of £3 17*s*. 10½*d*. per Troy ounce. Gold and silver were then declared to be unlimited legal tender. But, as the true value of the guinea was overrated by 4*d*. and silver underrated by the same amount, debts were preferably paid in gold, while silver coins were exported. Thus gold became the recognized measure of value in Great Britain, though exchanges were still in terms of silver, and for an exactly opposite reason silver became the recognized measure of value in France. At the great recoinage of 1816 this custom passed into law. Gold was then declared to be the only legal measure of value and legal tender to an unlimited amount, and the sovereign (£1) was struck to represent the value at that time of 20*s*. in silver. Sixty-six shillings, 22 carats or $\frac{11}{12}$ fine, are coined to a pound Troy weight, 66 pence to an ounce, giving a value-ratio between gold and silver of 1 : 14¼ (14·28). In the French Revolution, at the time of the adoption of the metric system of weights and measures, the basis was established for a reform in the currency; the *franc*, a silver piece of 5 grammes, $\frac{9}{10}$ fine, being made the unit. Gold and silver were both to be coined freely at a ratio of 15½ to 1. Many other countries conformed to the example set by France. See LATIN UNION.

The coinage of American colonies was based on that of England, but became much depreciated about the time of the Revolution. In the reform of 1792 the Spanish milled dollar was taken as a model. The law of 1792 provided for the coinage of *eagles* of the value of ten dollars, to contain 247½ grains of pure gold; half and quarter eagles of corresponding weights; dollars, to contain 371¼ grains of pure silver, with halves, quarters, dimes, and half-dimes of corresponding weights, and cents and half-cents of copper. The law of 1834 reduced the weight of gold in the eagle to 232 grains of pure metal, or 258 grains actual weight, including alloy, and other gold coins were reduced proportionally. The law of 1837 slightly changed the proportion of alloy in the silver coins, reducing the gross weight of the silver dollar from 416 grains to 412½, but leaving the amount of pure metal unchanged. The law of 1849 authorized the coinage of gold dollars and of double eagles. The law of 1851 authorized the coinage of silver three-cent pieces. The law of 1852 reduced the weight of fractional silver coins to 192 grains for the half-dollar, and corresponding amounts for smaller pieces. It also provided for a three-dollar gold-piece. In 1857 the coinage of half-cents was wholly discontinued, and a nickel cent substituted for that of copper. In 1864 the bronze cent was substituted for nickel, and two-cent pieces of the same metal were authorized. In 1865 the coinage of the nickel three-cent was instituted, and in 1866 the nickel five-cent. The act of 1873 discontinued the silver half-dime and three-cent coinage, which had practically ceased long before. The act of 1873 discontinued the coinage of the silver dollar (see SILVER COINAGE for this and for the acts of 1878 and 1890); it established a trade dollar of 420 grains for use in eastern trade, whose coinage was limited in 1876 and abolished in 1887. The coinage of the three-dollar and one-dollar gold-pieces and three-cent nickel-piece was abolished in 1890.

Relative Value of Gold and Silver in Coinage.—Without reference to ancient periods, from about 1687 accurate data are at hand as to the relative value of gold and silver. The annual ratio from 1687 to 1800 did not vary materially from 1 of gold to 15 and a fraction of silver, reaching 1 to 14·14 in 1760 and 1 to 15·74 in 1799. From 1800 to 1872 the ratio kept with even more uniformity between 1 to 16·25 (in 1813) and 1 to 15·19 (in 1859). Between the period of 1687 and 1872 the relative value of gold and silver was thus practically maintained at 1 to 15 and a fraction. The average price of silver in 1873 was 59¼ pence, and its value-ratio to gold 15½ to 1, notwithstanding differences in coinage ratios, as in the U. S. and India. The difference in the relative value of the precious metals has gradually widened since 1873, until at present it is about 1 to 24, the decline to 38 pence representing a fall of 36 per cent. in twenty years against 2 per cent. in the preceding period of forty years.

The closing of the mints of the world to the coinage of silver has had a material influence in altering the stable ratio which existed for over two hundred years. Germany adopted in 1873 the gold standard. The silver coins were called in and new gold and silver coins issued, the latter being a limited tender. A large stock of silver coins was melted into bullion and put on the market. In the same year Norway, Sweden, and Denmark adopted the gold standard. Holland, which had been on a silver basis from 1847, nominally adopted in 1875 the double standard at the anomalous ratio of 1 to 15⅝, but in fact prohibiting the coinage of full legal-tender silver. The states of the Latin Union (i. e. France, Switzerland, Italy, Belgium, and Greece) in 1874 limited, and afterward suspended, the coinage of full legal-tender silver. By the law of Sept. 9, 1876, Russia

suspended the coinage of silver except such as was necessary for trade with China. In Austria-Hungary gold only has been coined for individuals since 1879, except trade silver coins called levant-thalers. The only mints open to the coinage of silver for individuals at this time are those of Mexico and Japan.

Millesimal Fineness.—The purpose of alloying gold and silver with a base metal in the manufacture of coins is no longer, as in earlier periods, to debase the coins, but to increase their durability.

For the purpose of determining the proportion of alloy best suited to resist wear, experiments have been made from time to time—notably in England in 1798, and afterward at the Royal Mint in London. The composition of 900 parts of pure metal and 100 parts of copper, first prescribed in France in the coinage law of 1795, being in consonance with the decimal system of coinage, has proved the most durable, and in all respects the most desirable—at least, for gold coins.

Among nations whose coinage is important, Great Britain may be said to be the only one whose gold coins do not now conform to the millesimal standard of 900 parts of pure metal to 100 parts of copper; the British proportion being $\frac{11}{12}$ instead of $\frac{9}{10}$. In the composition of full legal-tender silver coins there is even greater uniformity than in gold coins. The standard of 900 parts of pure silver and 100 parts of copper is almost universal. The more noteworthy exceptions are the two great silver-coining countries of India and Mexico. India has the same standard for silver as for gold coins—viz., $\frac{11}{12}$ of pure metal to $\frac{1}{12}$ of copper. Mexico employs the anomalous standard of 902·7. Holland has a standard of 945 parts of pure silver to 55 of copper.

There is more diversity in regard to the composition of limited-tender silver coins. The majority of countries employ either the standard of the U. S.—namely, 900 parts of pure silver to 100 parts of copper—or the standard of the Latin Union, 835 of pure silver to 165 of copper. In some countries a difference between legal-tender silver coins and silver coins of limited tender is made by adoption for the latter of a lower degree of fineness, or else, as in the case of the subsidiary coins of the U. S., of less proportional weight, but of the same fineness as compared with standard coins. See Latin Union.

The following countries have the same system of coins as the Latin Union, although the South American states, with the exception of the Argentine Republic, have the silver standard—viz., Argentine Republic, Bolivia, Bulgaria, Central American states, Colombia, Ecuador, Peru, Roumania, Servia, Spain, and Venezuela.

Free and Gratuitous Coinage: Seigniorage.—Free coinage exists where any man can take bullion to the mint and have it made into coin, either gratuitously or with a deduction not to exceed the actual expenses of coinage. Both Great Britain and the U. S. have free coinage of gold; but in Great Britain it is gratuitous, while in the U. S. it is not. Any deduction in excess of the actual cost of coinage is known as seigniorage. The objects of seigniorage are many—sometimes to debase the coin for the sake of the fiscal exigencies of the government; sometimes to secure money like the fractional coins which shall be secure from the danger of being melted down for exports or for use in the arts. In all cases of this kind the government makes an apparent profit on the issue of all such coins; but, if this is carried far, especially in the "legal-tender" coins which anyone must receive in payment of all debts, it is subject to great danger.

Value of Foreign Coins.—An authorized statement on this subject is published quarterly by the Secretary of the Treasury. The statement for Apr., 1901, is as follows:

VALUES OF FOREIGN COINS, APRIL 1, 1901.

COUNTRY.	Standard.	Monetary unit.	Value in terms of U. S. gold dollar.	Coins.
Argentine Republic	Gold and silver	Peso	$0 96, 5	Gold: Argentine ($4 82, 4) and ½ Argentine. Silver: peso and divisions.
Austria-Hungary	Gold	Crown	20, 3	Former system—gold: 4 florins ($1 92, 9), 8 florins ($3 85, 8), ducat ($2 28, 7), and 4 ducats ($9 15, 8). Silver: 1 and 2 florins. Present system—gold: 20 crowns ($4 05, 2) and 10 crowns.
Belgium	Gold and silver	Franc	19, 3	Gold; 10 and 20 francs. Silver: 5 francs.
Bolivia	Silver	Boliviano	45, 1	Silver: Boliviano and divisions.
Brazil	Gold	Milreis	54, 6	Gold: 5, 10, and 20 milreis. Silver: ½, 1, and 2 milreis.
British possessions, N. A. (except Newfoundland)	Gold	Dollar	1 00	
Central American States: Costa Rica, Guatemala, Honduras, Nicaragua, Salvador	Silver	Peso	45, 1	Silver: peso and divisions.
Chili	Gold and silver	Peso	36, 5	Gold: escudo ($1 25), doubloon ($3 65), and condor ($7 30). Silver: peso and divisions.
China	Silver	Tael. Shanghai	66, 6	The tael, however, is not a coin, but a money of account, being simply one Chinese ounce of fine silver (sycee), equal to 1⅓ oz. avoir.
		Tael. Haikwan (customs)	74, 2	
Colombia	Silver	Peso	45, 1	Gold: condor ($9 64, 7) and double condor. Silver: peso.
Cuba	Gold and silver	Peso	92, 6	Gold: doubloon ($5 01, 7). Silver: peso (60 cents).
Denmark	Gold	Crown	26, 8	Gold: 10 and 20 crowns.
Ecuador	Silver	Peso	45, 1	Gold: condor ($9 64, 7) and double condor. Silver: sucre and divisions.
Egypt	Gold	Pound (100 piasters)	4 94, 3	Gold: pound (100 piasters), 50 piasters, 20 piasters, and 10 piasters. Silver: 1, 2, 5, 10, and 20 piasters.
Finland	Gold	Mark	19, 3	Gold: 20 marks ($3 85, 9), 10 marks ($1 93).
France	Gold and silver	Franc	19, 3	Gold: 5, 10, 20, 50, and 100 francs. Silver: 5 francs.
German empire	Gold	Mark	23, 8	Gold: 5, 10, and 20 marks.
Great Britain	Gold	Pound sterling	4 86, 6½	Gold: sovereign (pound sterling) and ½ sovereign.
Greece	Gold and silver	Drachma	19, 3	Gold: 5, 10, 20, 50, and 100 drachmas. Silver: 5 drachmas.
Hayti	Gold and silver	Gourde	96, 5	Silver: gourde.
India	Gold	Rupee	32, 4	Gold: sovereign ($4 86, 65). Silver: rupee and divisions.
Italy	Gold and silver	Lira	19, 3	Gold: 5, 10, 20, 50, and 100 liras. Silver: 5 liras.
Japan	Gold	Yen	49, 8	Gold: 1, 2, 5, 10, and 20 yen.
Liberia	Gold	Dollar	1 00	
Mexico	Silver	Dollar	49	Gold: dollar, 2½, 5, 10, and 20 dollars. Silver: dollar (or peso) and divisions.
Netherlands	Gold and silver	Florin	40, 2	Gold: 10 florins. Silver: ½, 1, and 2½ florins.
Newfoundland	Gold	Dollar	1 01, 4	Gold: 2 dollars ($2 02, 7).
Norway	Gold	Crown	26, 8	Gold: 10 and 20 crowns.
Peru	Silver	Sol	48, 7	Gold: libra ($4.86, 65). Silver: sol and divisions.
Portugal	Gold	Milreis	1 08	Gold: 1, 2, 5, and 10 milreis.
Russia	Gold	Rouble	51, 5	Gold: imperial ($7 71, 8), and ½ imperial * ($3 80). Silver: ¼, ½, and 1 rouble.
Spain	Gold and silver	Peseta	19, 3	Gold: 25 pesetas. Silver: 5 pesetas.
Sweden	Gold	Crown	26, 8	Gold: 10 and 20 crowns.
Switzerland	Gold and silver	Franc	19, 3	Gold: 5, 10, 20, 50, and 100 francs. Silver: 5 francs.
Turkey	Gold	Piaster	04, 4	Gold: 25, 50, 100, 250, and 500 piasters.
Uruguay	Gold	Peso	1 03, 4	Gold: peso. Silver: peso and divisions.
Venezuela	Gold and silver	Bolivar	19, 3	Gold: 5, 10, 20, 50, and 100 bolivars. Silver: 5 bolivars.

* Coined since Jan. 1, 1886. Old half-imperial=$3 98, 6.

In estimating the value of foreign coins the same practice has been followed as heretofore. The value of the monetary unit of countries having a gold or double standard was ascertained by comparing the amount of pure gold in such unit with the pure gold in the U. S. dollar, and the silver coins of such countries were given the same valuation as the corresponding gold coins with which they are interchangeable by law.

In countries having a silver standard, the values of the silver coins were fixed at the commercial value of the pure silver contained in such coins.

The world's coinage for the years 1898 and 1899 was estimated by the bureau of the U. S. mint to be as follows:

COUNTRIES.	1898.		1899.	
	Gold.	Silver.	Gold.	Silver.
United States	$77,985,758	$23,034,033	$111,344,220	$26,061,520
Mexico	599,442	22,066,445	676,063	18,749,740
Great Britain	28,204,336	6,200,237	43,852,085	7,910,885
Australasia	39,453,387	.....	46,926,487	.....
India *	.....	26,686,134	.....	†7,221,063
France	34,224,022	7,720,000	10,419,111	5,211,000
Germany	42,675,087	3,704,600	33,628,453	4,346,302
Russia ‡	135,788,949	21,373,189	194,481,077	20,967,769
Austria-Hungary #	14,367,363	1,369,352	4,992,663	3,176,050
Lichtenstein	112	.....	9,178	15,322
Spain	.....	.....	4,863,650	14,884,262
Italy	.....	528,650	.....	485,950
San Marino	.....	7,720	.....	28,950
Servia	.....	143,399	.....	.....
Japan	16,002,641	8,159,857	8,705,377	4,363,709
Portugal	.....	1,100,844	.....	2,754,000
Netherlands	437,259	562,800	724,452	265,320
Norway	.....	147,400	.....	160,800
Sweden	1,680,022	795,072	1,537,641	248,910
Denmark	267,046	53,800	.....	136,548
Belgium	.....	96,500	.....	96,500
Switzerland	1,544,000	424,600	1,158,000	115,800
Turkey	1,388,586	442,721	279,871	248,330
Arabia	.....	1,022	.....	1,022
Egypt	.....	856,114	.....	.....
Abyssinia	.....	401,440	.....	201,724
Persia	85,200	5,964,000	.....	.....
Hongkong	.....	3,150,000	.....	34,596,185
Indo-China	.....	4,589,800	.....	5,733,397
Tunis	579,232	347	579,232	347
Canada	.....	217,000	.....	398,895
Newfoundland	.....	39,804	.....	100,000
Costa Rica	.....	.....	698,023	10,000
Brazil	.....	.....	105,673	.....
Bolivia	.....	1,348,094	.....	1,941,532
Peru	195,161	120,000	164,658	165,000
Ecuador	.....	.....	964,700	50,000
Santo Domingo	.....	1,415,102	.....	240,395
German East Africa	.....	174,900	.....	73,567
Straits Settlements	.....	452,000	.....	636,000
Morocco	.....	606,918	.....	443,120
Mauritius	.....	.....	.....	9,730
Ceylon	.....	.....	.....	97,320
Siam	302	5,329,042	.....	4,080,000
	$395,477,905	$149,282,936	$466,110,614	$166,226,964

* Rupee calculated at coining rate, $0 4737.
† Fiscal year 1899–1900 rupee calculated at $0 3244.
‡ Rouble, $0 5145, coining rate. # Florin, $0 4052, coining rate.

The coinage executed at the mints of the U. S. during the fiscal year ending June 30, 1901, was as follows:

DENOMINATIONS.	Pieces.	Value.
Gold.		
Double eagles	3,924,635	$78,492,700 00
Eagles	2,177,934	21,779,340 00
Half eagles	1,505,811	7,529,055 00
Quarter eagles	54,406	136,015 00
Total gold	7,662,786	$107,937,110 00
Silver.		
Standard dollars	18,244,984	$18,244,984 00
Lafayette souvenir dollars	50,000	50,000 00
Total dollars	18,294,984	$18,294,984 00
Subsidiary:		
Half dollars	10,689,717	$5,344,858 50
Quarter dollars	19,263,569	4,815,892 25
Dimes	27,160,984	2,716,098 40
Total subsidiary	57,114,270	$12,876,849 15
Total silver	75,409,254	$31,171,833 15
Minor.		
Five-cent nickels	30,749,992	$1,537,499 60
One-cent bronze	70,551,761	705,517 61
Total minor	101,301,753	$2,243,017 21
Total coinage	184,373,793	$141,351,960 36

Of this total, $71,428,477.61 was coined at Philadelphia, $54,026,012.75 at San Francisco, and $15,897,470 at New Orleans.

Compare the *Annual Report* of the Directors of the Mint, published with *Finance Report* of the Secretary of the Treasury. Revised by ARTHUR T. HADLEY.

Coinage of Silver (Free, and Restricted): See SILVER COINAGE.

Coir: the fiber of the cocoanut and other palms. It is a valuable material for ropes, mats, etc. Coir is one of the best materials for cables, on account of its lightness, elasticity, and strength. Coir is produced from the fiber of various trees, especially the GOMUTI PALM (*q. v.*). It is largely produced in the Malay islands.

Cojedes, ko-hā'dās: a former state of Venezuela, now included in ZAMORA (*q. v.*).

Cojutepec': a town of Central America, in the republic of Salvador and province of Cuscatlan, about 15 miles E. of the capital (see map of Central America, ref. 4–F). From 1854 to 1858 it served as the seat of government, San Salvador having been ruined by a succession of earthquakes. Pop. less than 5,000.

Coke [origin obscure]: the residue obtained from bituminous coal by distillation or by heating with an almost entire exclusion of air. Certain kinds of bituminous coal, when heated to a temperature varying somewhat with their character, swell, become pasty, and throw off bubbles of gas which burn with a bright flame. The coals thus heated lose all traces of their original form, appearance, and structure, becoming a semi-fused mass, of strong luster, ringing when struck, and filled with cells and cavities. The coke produced in gas manufacture is a by-product, used locally for heating and steaming; that specially manfactured in ovens is employed in the melting of pig iron in cupolas, in the smelting of iron, copper, and lead in blast furnaces. The use of coke in the manufacture of pig iron was first successfully achieved by Darby in 1735 at Coalbrookdale, Shropshire, England, and became general in that country in 1750. In the U. S. William Firmstone first made pig iron successfully with coke in 1835, but it was not until 1837 that coke was used for any considerable length of time in the Lonaconing furnace in Maryland. In the Connellsville coke region in Pennsylvania, which has become the foremost seat of this great industry in the U. S., the first unsuccessful attempt at manufacture was made by Provance McCormick and James Campbell in 1841. Regular manufacture in that district did not begin until 1860. Coking was formerly largely carried on in piles or mounds, a method analogous to that used in the manufacture of vegetable charcoal, but is now generally done in ovens or kilns of brick or stone. The standard oven in England and in the U. S. is the "beehive," generally 11 to 12 feet inside diameter, and 5 to 6 feet from the floor to the crown of the roof. They are charged with coal from an opening in the roof, a track commanding the whole bank of ovens. They are discharged by raking from an orifice or door on the side, the coke being drawn on to a wharf from which it is forced into railroad cars, standing on a depressed track along the wharf. The coking lasts from forty-eight to seventy-two hours, the hot coke being quenched with water when withdrawn. On the Continent, and to a limited extent in England and the U. S., other forms of coke ovens are used, being generally massive chambers of fire-brick, in whose sides and bottom flues are arranged, in which the waste gases are burnt, thus heating the coal more rapidly. These ovens, among which the Simon-Carvès, Coppée, Appolt, Otto, and Bauer are the widest known, possess the advantage that they do much quicker work, afford a greater yield, and permit of the manufacture of good coke from coal which could not be used in the "beehive" oven. They admit also of the recovery of the by-products—the tar and ammonia in the gases of distillation. In Germany a very large and prosperous industry has grown up in the utilization of the by-products, some concerns having contracted for the delivery of the coke, free of cost, from coal furnished, provided they are allowed to recover and utilize the tar and ammonia. According to the report of the Geological Survey for 1899 there were in the U. S. 344 establishments operating 49,667 coke ovens, with 4,037 ovens building. They produced 19,668,569 short tons of coke from 30,219,343 short tons of coal, a yield of 65.1 per cent., the total value of the product at oven being $34,670,417, or an average of $1.76 a ton. The principal producer is Pennsyl-

vania, which made in 1899 13,577,870 tons of coke, of which the Connellsville district made 10,390,335 net tons. The Connellsville coal basin is in the southwestern part of Pennsylvania, some 50 or 60 miles from Pittsburg. It is a slender prong, separated from the Upper Coal Measures, and may be regarded as extending from S. of Latrobe, in a southwesterly direction to the Virginia line, forming a basin some 3 miles wide and 50 miles long, almost without a fault, the beds yielding from 8 to 10 feet of workable coal. The same trough that contains the Connellsville coal extends northwesterly from Latrobe, but the Connellsville region is regarded as extending no farther N. than the point indicated; the district N. of it being designated as the Upper Connellsville, or "washed coal" district, which in 1899 produced 609,893 tons of coke. The other leading districts of Pennsylvania, with their output in 1899, are as follows: Allegheny Mountain, 478,340 net tons; Clearfield Center, or Snowshoe, 130,965 net tons; Broad Top, 107,258 tons; Pittsburg, 644,467 tons; Reynoldsville-Walston, 972,933 tons; and Irwin, 133,085 tons. The State next in importanee is West Virginia, with a product of 3,802,825 net tons. Tennessee produeed in 1899 779,995 tons; Colorado, 898,207 tons; Virginia, 994,635 tons; and Alabama, to supply the heavy requirements of the Birmingham iron region, 3,028,472 tons. Southern Colorado makes nearly all the eoke used by the loeal industry and the lead and copper smelters. In the last few years experiments have been made in coking at the head of Lake Superior coal conveyed to that point from Pennsylvania, in order to smelt the cheap and rich ores of Lake Superior, using the pig iron made as the basis of iron manufacture to cover the requirements of the growing Northwest. See Jos. D. Weeks's *Manufacture of Coke*; Report Tenth Census and Annual Reports, by Joseph D. Weeks, in the *Mineral Resources of the United States*, published by the U. S. Geologieal Survey.

C. Kirchhoff.

Coke, Sir Edward: jurist; b. at Mileham, Norfolk, England, 1552; educated at Trinity College, Cambridge, Clifford's Inn, and the Inner Temple; rose rapidly in his profession, becoming solicitor-general (1592), Speaker of the House of Commons (1593), attorney-general (1594), chief justice of the common pleas (1606), and chief justice of the king's bench and privy counellor (1613). During the early part of his eareer his regard for royal favor betrayed him into a certain harshness and unfairness toward those brought before him for trial, as, for example, in the cases of Southampton and Essex (1601) and in that of Raleigh (1603), but after his appointment to the common pleas his attitude changed to that of a strong supporter of civil rights against royal encroaehments. The attempt of the king to give to the royal proclamation the force of law was stoutly resisted by Coke, who won over the other judges to eoncurrence in the opinion that such an assumption of power was in violation of the traditional rights of Englishmen. His appointment as chief justice of the king's beneh was designed to bring him to a more compliant spirit, while at the same time it made way for the promotion of his old enemy, Sir Franeis Bacon, but the warning was insufficient to deter him from opposing the exereise of arbitrary power by the king, and three years later he was removed from office. Then followed the most brilliant period of his life. He became an enemy to the eourt party, and as member of Parliament in 1621 was one of the foremost champions of parliamentary privilege against the king's attacks. He drew up the great protestation in support of the right of freedom of debate. The king tore it from the journal of the house, dissolved Parliament, and Coke paid the penalty of his zeal by a nine-months imprisonment in the Tower. He carried his opposition into the next reign, and the petition of right (1628) was framed and passed largely through his efforts. He died at Stoke Poges in 1634. An acute and able lawyer and a man of deep learning and fearless charaeter, he laeked the self-poise and calmness of temper that should distinguish the judge. Of his *Four Institutes*, the so-ealled *Coke upon Littleton* is the most famous, and is still a work of real value. His *Law Reports* are equally well known.

Coke, Thomas, D. D., LL. D.: the first bishop in the U. S. of the Methodist Episcopal Church; b. in Brecon, Wales, Sept. 9, 1747; educated at Oxford; became a minister of the Church of England, but subsequently joined Wesley, and was a most laborious and faithful itinerant. He was made a bishop for Ameriea by Wesley in 1784; ordained Asbury the same year as joint superintendent of the church in Ameriea, but did not confine his labors to this country. He traversed Great Britain and Ireland frequently, and crossed the Atlantic eighteen times. He founded the Wesleyan missions in the East and West Indies, in Gibraltar and Sierra Leone, and expended nearly all his large fortune in these undertakings. D. May 2, 1814, on a voyage to India, and was buried at sea. He was a voluminous writer and left a *Life of Wesley* (1792); *Commentary on the Holy Scriptures* (6 vols., 1803–07); *History of the West Indies* (1808), etc. See Stevens's *History of Methodism*, and *History of the Methodist Episcopal Church*.

Cola (more eorreetly *kola*): the nut of the *Cola acuminata*, a tree growing in Africa. . It depends for its activities upon two alkaloids, colanine and caffeine. Its action upon the body is partly that of coffee and partly that of coea. As a drug its exact value has not yet been determined. It has been used in siek headache, sea-siekness, and feebleness of the eirculatory and nervous systems.

Col'ban, Adolphine Marie (*Schmidt*): Norwegian novelist; b. in Christiania, Dec. 18, 1814; d. in Rome, Mar. 27, 1884. Her best story is perhaps *Jeg lever* (I Live, 1877); others are *En gammel Jomfru* (An Old Maid, 1879); *Cleopatra* (1880); *Thyra* (1882). She also wrote translations and short tales.

G. L. K.

Colberg, kōl'bārch: seaport-town of Prussia; province of Pomerania, on the river Persante near its entrance into the Baltic; about 143 miles N. E. of Berlin (see map of German Empire, ref. 2–H). It has a handsome Rathhaus, an old cathedral, salmon and lamprey fisheries, commerce, and salt-works. It has sustained several protracted sieges. Pop. (1890) 16,999.

Colbert, kōl'bār', Jean Baptiste: statesman and financier; b. at Rheims, France, Aug. 29, 1619; entered the service of Cardinal Mazarin 1648; became secretary to the queen 1654. Mazarin at his death recommended Colbert to the king, who in 1660 appointed him controller-general of the finances, which were then in a ruinous condition. The annual revenue exacted from the people in 1660 was about 84,000,000 livres, but only 32,000,000 were reeeived into the treasury, the rest being kept by the farmers of the revenue. Colbert reformed the financial system, and established order and economy in the government. In the eourse of twenty years he raised the gross revenue to 115,000,000, while the expense of collecting it was reduced to about 30,000,000. He promoted commerce and manufactures, opened canals and roads, and founded eolonies in America. He also made reforms in the Department of Marine, of which he was appointed minister in 1669. No minister perhaps ever contributed so much to the prosperity of France. He was a liberal patron of literary and seientific men, and was the founder of the Academy of Inscriptions and Academy of Sciences. His influence at eourt was undermined by Louvois, and his efforts to dissuade Louis XIV. from his ruinous wars and extravagant expenses were unavailing; but he retained the offiee of eontroller-general until his death. D. in Paris, Sept. 6, 1683. See Gourdault, *Colbert, Ministre de Louis XIV.* (n. ed. 1885).

Revised by C. H. Thurber.

Colborne, Langdon: organist and composer; b. in London in 1837, and educated there. In 1860 he was organist of St. Michael's College, Tenbury, and remained in that position for fourteen years, taking his degree Mus. Bac. during that period from Cambridge University. In 1877 he sueceeded the late Townshend Smith as organist of Hereford Cathedral, where he still remains. His compositions are chiefly chureh musie, but they include one oratorio, *Samuel*, for the Hereford festival of 1888.

D. E. Hervey.

Colburn, Warren: mathematician; b. in Dedham, Mass., Mar. 1, 1793; graduated at Harvard 1820; became a school-teacher in Boston. In 1821 he published his *Mental Arithmetic*, one of the most famous and most widely translated and circulated text-books ever issued. He also wrote some other edueational books. D. in Lowell, Mass., Sept. 13, 1833.

C. H. T.

Colby, Charles Carroll: Canadian statesman; b. in Derby, Vt., Dec. 10, 1827; graduated at Dartmouth College in 1847. He was admitted to the bar of Lower Canada in 1855; has been a member (Conservative) of the Dominion Parliament 1867–91; deputy-speaker of that body 1887–89; and appointed president of the Privy Counеil of Canada in 1889.

Neil Macdonald.

Colby University: an institution of learning under control of the Baptists; situated at Waterville, Me. It was chartered by Massachusetts in 1814, went into operation in 1818, and was incorporated as Waterville College by the first legislature of Maine 1820. In 1867, in recognition of the munificent gifts of Mr. Gardner Colby, a merchant of Boston, the name was changed to Colby University. It has six large college buildings of brick and stone, besides a gymnasium, an observatory, and three houses occupied by young women. The endowment funds amount to $473,353. The faculty is composed of sixteen professors. The university has a fine library of 34,500 volumes. In 1900 the number of students enrolled was 195, of whom 68 were young women. In 1891 "co-education" was reorganized into "co-ordinate colleges." The young men and the young women pursue identical courses of study, if they so elect, and under the same instructors. They recite separately, are not competitors in rank, and have separate groups of prizes.

Colchagua: a province of Chili; bounded N. by Santiago and O'Higgins, S. by Curico, and extending from the Pacific to the top of the Andes. Area, 4,630 sq. miles. The western portion is crossed by the coast range, and the eastern lies in the Andes; all the central part is included in the rich plain or "valley" of Chili, and some of the finest wheat and pasture land is in this province. Pop. (1895) 157,566. Capital, San Fernando (7,447 inhabitants).

HERBERT H. SMITH.

Colchester, kōl'ches-ter (anc. *Camalodunum*): a parliamentary borough and river-port of England; in Essex; on the river Colne; 12 miles from the sea, and on the Great Eastern Railway, 51 miles N. N. E. of London (see map of England, ref. 11–L). It is well built on the sides and summit of an eminence, and has imposing remains of a castle built in the twelfth century. It was of much importance when the *Domesday Book* was compiled. Great quantities of Roman remains have been found here, including coins of Roman emperors, vases, urns, lamps, etc. The borough returns one member to Parliament. There are manufactures of silk and a large oyster-fishery, formerly very valuable. The town contains a grammar school, a literary institute, a theater, a large hospital, and an asylum for imbeciles and idiots. The import and export trade is conducted at Hythe, a suburb. Colchester is in an extensive agricultural district, and possesses large corn and cattle markets. Pop. (1891) 34,559.

Colchester: town on Air Line Div. of N. Y., N. H. and H. R. R., New London co., Conn. (for location of county, see map of Connecticut, ref. 10–J); has manufactures of india-rubber and paper, and is the seat of Bacon Academy. Pop. of township (1880) 2,974; (1890) 2,988; (1900) 1,991; borough, 858.

EDITOR OF "ADVOCATE."

Colchicine, kol'ki-sin ($C_{17}H_{19}NO_6$): a very powerful alkaloid extracted from all parts of *Colchicum autumnale* (meadow saffron). It produces, even in very small doses, violent vomiting and purging, but in still smaller doses is a useful remedy in gout.

Colchis, kol'kis (in Gr. Κολχίς): an ancient province of Asia; bounded on the N. by the Caucasus, S. by Armenia, W. by the Pontus Euxinus (Black Sea). It was celebrated in ancient fable and poetry as the place to which the Argonauts sailed for the golden fleece, and as the home of Medea. It was noted for its wines and fruits, and was the native country of the pheasant, which derived its name from Phasis, a river of Colchis. It is now part of the Russian dominions.

Cold: absence of heat. In the popular usage cold is a relative term, the distinction between it and heat depending upon the assumption of some arbitrary standard of comparison, as, for instance, the normal temperature of the human body. At various times, however, physicists have sought for the greatest cold, and in the older literature one meets with various freezing mixtures which were supposed to produce the lowest possible temperature. More recently, however, the matter has been put upon a scientific basis, and we may now speak of absolute cold. According to the modern "dynamic theory" HEAT (*q. v.*) is a mode of motion, the minute particles or molecules of which any body is composed being in constant vibration; and the more rapid this molecular vibration, the warmer the body; the slower they become, the colder it is. In this way we can readily conceive a condition at which this molecular vibration should entirely cease, and this would be the absolute cold or absolute zero of the physicist. Although this point has never been actually attained, it is readily computed, and is 273° of the centigrade scale below the freezing-point of water, or 459·4° below zero by the ordinary or Fahrenheit thermometer. The speculations regarding the conditions of matter at absolute zero are most interesting. There is much evidence to show that chemical affinity would disappear, gases would not exist, and that matter would break up into its constituent atoms.

The greatest degree of cold as yet obtained is about — 200° C. (about 330° below zero Fahrenheit) produced by boiling liquid oxygen under reduced pressure. Turning now to the ordinary significance of the word cold—a lower temperature than the normal—some interesting physiological phenomena are to be noticed. There are certain degrees of cold below which life can not exist. These limits vary somewhat widely, and death from cold may be produced in several ways. Thus in man death occurs by a retardation of the circulation and a slowing of the action of the heart accompanied by loss of heat, until finally respiration and circulation cease and death supervenes, and this may occur, as in the case of persons long immersed in cold water, without the lowering of the temperature to freezing. On the other hand, many animals and plants flourish in the Arctic seas, and some forms can withstand an even greater extreme than this. Thus yeast may be frozen and cooled to — 5° C. (23° F.) without injury, and, if dry, the temperature could be reduced to that of solid carbonic acid (— 60° C., —76° F.) without being killed.

J. S. KINGSLEY.

Cold: EFFECTS UPON MAN. The effects of cold upon man depend upon its degree, method of application, the extent and region of the body affected, and the general condition of the bodily structures. They are of a local and general character, the former being manifest at the region of the application, and the latter by the organism as a whole. When the cold is moderate in degree and transient, as when an individual enters a cool room, is subjected to a cold douche or draft, or plunges into a cold bath, the chief immediate effects are a reduction in the temperature of the skin, constriction of the cutaneous capillaries, a sensation of cold, shivering, and roughening and paleness of the surface of the skin, which becomes like "goose-flesh." The secondary or after effects are those of an opposite character, or those of "reaction," and there is experienced a sense of exhilaration and well-being. In healthy individuals douches, baths, and similar applications, when followed by reaction, are of a decidedly stimulating and tonic character; but in those weakened by disease or otherwise enfeebled the system may not properly react, so that the secondary effects may be those of depression, continued chilliness, etc., and prove injurious. Indeed, even among healthy people we find those who at times or always do not seem to have the power of healthy reaction from sudden, though transient, changes in surrounding temperature, and who are likely as a consequence to suffer from various sequelæ which depend upon the nervous irritation and the temporary congestion of the interior of the body caused by the driving of the blood from the skin, so that bronchitis, pneumonia, diarrhœa, kidney troubles, etc., are frequently observed.

When the cold is applied for a prolonged period the effects depend in a large measure upon its suddenness and degree. When the change of temperature occurs slowly, as when the individual travels to a cooler climate, our systems so readily accommodate themselves to the alterations in the temperature that no phenomena of importance are manifest, save the consciousness of cooler surroundings, and usually a mild exhilaration and stimulation of the vital processes. But when the reduction of temperature is sudden, persistent, and of decided degree, the primary effects are the same as those observed in the cold bath or douche, but more intense, and the reaction is greater and lasts for a longer period; or, if reaction does not properly occur, the pernicious after effects are commonly of a more serious nature. Long-continued intense cold, such as that produced by a freezing mixture, causes the blood-vessels of the skin to become intensely constricted, with the consequent deprivation of nearly all of the normal blood supply of the skin and the production of internal congestion; heat is rapidly lost, owing to the marked disparity between the temperatures of the body and the surroundings, so that bodily temperature falls; heat production is increased to make up for this loss, with the consequent consumption of the tissues and of the nutritive substances stored in the organism; and the circulation and respiration

are increased. These effects are soon followed by dilatation of the cutaneous vessels, with attendant congestion, and owing to this there is an increased tendency to a loss of heat and diminution of the body temperature; the heart's action becomes enfeebled, and the circulation grows more and more sluggish, so that there is insufficient oxygenation, the blood is unduly robbed of its oxygen by the tissues, causing lividity of the skin; the sensory nerves are first irritated and then depressed, owing to the lowered temperature and deficient blood-supply, causing first pain, then numbness, and finally complete paralysis. The lowered bodily temperature and the impairment of the circulation depress all the vital processes; the vessels in the interior of the body also undergo dilatation, so that the lungs, brain, and other important organs are in a profound condition of congestion, with an extremely sluggish circulation; the action of the heart becomes feebler and feebler; the waste products which result from the consumption of the tissues and nutritive substances rapidly accumulate, owing to the lessened activity of the excretory organs, and act as depressants to the already weakened organs; the nerve centers are more and more depressed, which is specially marked in a sense of fatigue, mental apathy, drowsiness, sleep, impairment of all the special senses, coma, general paralysis, and death. When the action of intense cold has been carried to a dangerous stage the after effects may be apparent for hours, days, or even indefinite periods, and commonly are manifest in a slow recovery of the normal conditions, but the dangers of serious sequelæ are very great.

Portions of the body that have been frozen can generally be restored by proper treatment, the usual method being to gradually restore the temperature of the affected parts by rubbing with snow or by the application of iced water, but any undue rubbing and any movement of the frozen structures must be avoided sedulously, lest the delicate tissues be torn or cut by the crystals of frozen blood and lymph.

The moderate use of iced water as a beverage is not only a source of great refreshment to most people, but is rarely attended with evil consequences; yet when taken in excessive quantities, especially when the body is overheated, it may cause serious internal disturbances, particularly congestive and inflammatory disorders of the stomach, liver, intestines, and kidneys. Iced water, ices, etc., taken with meals do not seem to exert any pernicious influence on the digestive processes, but digestion is always more or less seriously interfered with if they are taken during the time when active digestion is going on, i. e. during the two or three hours immediately after a meal.

In the treatment of diseased conditions cold has proven of great value, and its use as a remedial agent is of increasing importance. As a local application it is of great benefit in benumbing the sensory nerves, thus relieving pain and other phenomena due to irritation. So powerful are its effects in this respect that by appropriate means the sensory nerves may be completely paralyzed, and thus a condition of local anæsthesia produced. This may be accomplished by holding a piece of ice to the part for a few minutes, or better and commonly by the use of a spray of ether, rhigoline, or other highly volatile fluid, projected upon the part by means of an ordinary hand-atomizer. The fluid by its rapid evaporation abstracts the heat from the part, constricts the capillaries, benumbs and then destroys the irritability of the sensory nerves, and ultimately freezes the area. By means of an ice poultice (ice and sawdust), an ice bag (rubber bag with ice in it), moist clay, or a compress of a number of thicknesses of wet cloth, cold is often applied to the chest in the treatment of pneumonia and pleurisy, to the abdomen in peritonitis, to the head in meningitis, and to other parts when inflamed. Iced water is sometimes used as an enema in dysentery. Cold applications are frequently made to nerves in cases of neuralgia, and to parts chronically inflamed. Cold baths have proven of inestimable value in the treatment of certain fevers, especially thermic fever (sunstroke), typhoid, typhus, scarlet fever, etc. In the treatment of thermic fever and typhoid no other form of therapeusis has proven as valuable. In such cases the individual is placed in a bath of about 90° F., but in cases of thermic fever the temperature of the bath is frequently greatly lowered by the addition of ice, the object being to cause a rapid abstraction of heat from the body, to the excess of which the serious condition is due. In the treatment of scarlet fever and kindred disorders the bathing is usually done by means of a sponge or rag, one part of the body after another being successively bathed and dried. The results of such applications are usually almost immediately manifest in an improvement of the febrile state, which continues for variable periods in different cases. EDWARD T. REICHERT.

Col de la Seigne, kol'de-laă-sāñ': an Alpine pass leading from Savoy into the Val d'Aosta in Piedmont; 7 miles W. S. W. of Mont Blanc. Height, 8,422 feet.

Colden, CADWALLADER: Lieutenant-Governor of the province of New York from 1761 to 1775; repeatedly acting as governor in the absence of the chief executive; b. in Dunse, Scotland, Feb. 17, 1688; emigrated about 1708 to Pennsylvania, where he practiced medicine; invited to New York in 1718 by Gov. Hunter; was the first surveyor-general of the colonies. He was a royalist and incurred odium for his efforts to enforce the stamp tax in New York. D. on Long Island, Sept. 28, 1776, of grief, it is said, at witnessing the destruction caused by the great fire of that year. Among his works are numerous essays on medical subjects, and others on natural philosophy, natural history, and the mathematics. He carried on a long correspondence with Linnæus, to whom he sent great numbers of American plants. His memoir upon them, entitled *Plantæ Coldenshamiæ*, etc., was published by Linnæus in the *Acta Upsaliensia*, and is, perhaps, the earliest botanical treatise written in North America. Linnæus gave the name *Coldenia* to an East Indian plant.

Cold Harbor: a locality in Hanover co., Va.; about 10 miles N. E. of Richmond.

In May, 1864, Gen. Grant, continuing his movement from Spottsylvania, had reached the vicinity of the Chickahominy, and on the 31st, Sheridan, with his two divisions, occupied Cold Harbor, driving the Confederates from the place, and maintaining his position until relieved, June 1, by the Sixth Corps and the Eighteenth Corps (Gen. W. F. Smith), which latter had just arrived (viâ White House) from Butler's army on the James river. About 5 P. M. both Wright and Smith attacked Lee, carrying a good part of his first line, but were unable to force him from his second line, and the effort was abandoned after a loss of 2,000 men. The portion of the army not engaged in the main attack received repeated assaults, all of which were repulsed with great loss to the enemy. Ineffectual attempts were made by the Confederates during the night to regain the ground lost during the day. June 2 was devoted to the rearrangement of the army. The Second Corps (Hancock) was moved forward, and placed on the left of the Sixth, which was resting on the left of the Eighteenth; the Ninth Corps (Burnside) was drawn into Bethesda Church, and the Fifth Corps (Warren) extended to the left, to connect with Smith. In executing this operation both Warren and Burnside sustained attacks, which were repulsed, with the loss of some prisoners, however.

The morning of June 3 opened with rain, but at 4.30 A. M. the Second, Sixth, and Eighteenth Corps furiously assaulted the Confederates in their intrenchments. Barlow's and Gibbons's divisions of the Second Corps carried a portion of the enemy's line, but were compelled to withdraw before reenforcements could reach them. An equally gallant and vigorous assault was made by the Sixth and Eighteenth Corps, which reached the enemy's outer rifle-pits before it was stopped. Although not able to carry the Confederate works these troops seized and fortified a line well in advance of that originally occupied, and very near the Confederate works. Warren, whose line was much extended, and Burnside also moved forward and prolonged this advanced line; and Burnside later in the day worked well around the Confederate left flank, but made no further advance, owing to the failure of the attack on the right; and the army intrenched themselves in their position, close to the Confederates' main line of works. The attack lasted only about half an hour, yet in that short time Grant's loss was not less than 7,000, while Lee's loss, which is nowhere accurately reported, was very small. His losses from June 1 to June 12 were probably between 1,500 and 2,000 men. The oft-repeated statement that Gen. Grant ordered a repetition of the attack, and the army lay still and refused to obey, is not true. An attack was made on Gibbons's division about 9 P. M., which was repulsed. The total Federal loss at and around Cold Harbor was 12,738.

The two armies remained confronting each other till June 12, when Grant, moving rapidly, crossed the Chickahominy at the lower crossings, reaching the James river on the 15th, which was also successfully crossed on pontoons and ferry-boats, and took up his position near Petersburg.

Cold Spring: village; Putnam co., N. Y. (for location of county, see map of New York, ref. 7–K); on N. Y. C. and H. R. R. R., and on the east bank of the Hudson, 52 miles N. of New York. It is pleasantly situated among the Highlands, a mile above West Point, and has 5 churches, 2 graded schools, a bank, a library, a furnace, and manufactures of cannon, machinery, brass castings, etc. Pop. (1880) 2,111; (1890) of Phillipstown, including Cold Spring and Nelson villages, 4,113; (1900) 4,642; village, 2,067. EDITOR OF "RECORDER."

Cold Spring, or (in U. S. Postal Guide) **Cold Spring Harbor**: village; Suffolk co., N. Y. (for location of county, see map of New York, ref. 8–K); on Long Island R. R., and on the east side of Cold Spring Harbor; has some manufactures and ship-building, and formerly was a whaling-port. The artificial hatching of fish, for which the place presents special opportunities, is very successful here. Pop. (1880) 857; not since returned separately.

Coldstream: a border-town of Berwickshire, Scotland; on the left bank of the Tweed; 15 miles S. W. of Berwick (see map of Scotland, ref. 12–J). The river is here crossed by a bridge. Before the Reformation it was the seat of a priory famous as the place where, in the reign of Henry VIII., the papal legate issued a bull against the printing of the Bible. In the nineteenth century the production of Bibles at cheap prices was carried on on the site of the building from which the bull was issued. Near this place is the famous ford where the English and Scottish armies formerly crossed the Tweed. Here Gen. Monk raised the regiment still known as the COLDSTREAM GUARDS (*q. v.*). Pop. 2,500.

Coldstream Guards: one of the three regiments of Foot Guards in the British army. It was first called Monk's regiment, but received its present name when it was given to Charles II. as part of his Household Brigade.

Coldwater: a city: capital of Branch co., Mich. (for location of county, see map of Michigan, ref. 8–I); on the Lake Sh. and Mich. So. R. R., and on Coldwater creek; midway between Detroit and Chicago. It has manufactures of iron, wood, oil, flour, etc. There is a park, two libraries, and a high school. The State school for pauper children is in Coldwater. Pop. (1880) 4,681; (1890) 5,247; (1900) 6,216. EDITOR OF "REPUBLICAN."

Cold Wave: a sudden and general fall of temperature which advances from a cold region over a warmer one. In the Eastern U. S., during the cold months, cold waves from the northern plains often cause a fall of 18° F. or more, and bring the temperature down to or below freezing. Cold waves usually cross the border of the U. S. between Lake Superior and the Rocky Mountains, and gradually spread eastward—sometimes also southeastward or southward. They usually follow sharply on a winter storm, and rarely continue more than two or three days. They are objects of forecast by the Weather Bureau, and the success in prediction is good. M. W. H.

Cole, JOSEPH FOXCROFT: landscape-painter; b. in Jay, Me., Nov. 9, 1837; pupil of Lambinet and Jacque, Paris; medal, Centennial Exhibition, Philadelphia, 1876, for his *Twilight*, *Melrose Highlands*, and *Coast Scene in Normandy*. Member of the Society of American Artists 1880. His professional life was spent in France and in Boston. His latest work inclined to impressionistic methods, and his pictures are good in composition and color. D. in Boston, May 2, 1892. WILLIAM A. COFFIN.

Cole, THOMAS: landscape-painter; b. in Bolton-le-Moors, Lancashire, England, Feb. 1, 1801; d. at Catskill, N. Y., Feb. 11, 1848; removed to the U. S. with his parents in 1819, and began his art studies in Ohio, where his father had settled, under a local portrait-painter named Stein. Went to New York in 1825, and first attracted attention by the exhibition of pictures of Hudson river scenery. Among other works he painted an allegorical series of pictures entitled *The Voyage of Life*, which were very popular and were engraved. His *Angel Appearing to the Shepherds* is in the Boston Athenæum, his *Course of Empire* and other works are owned by the Historical Society, New York, and his *Expulsion from Paradise* is in the Lenox Library, New York. His work possesses very small artistic value, but is interesting in the development of American art. He was one of the founders of the National Academy, New York. WILLIAM A. COFFIN.

Cole, VICAT: landscape-painter; b. in Portsmouth, England, 1833; pupil of his father, George Cole, a landscape-painter (1810–83); Royal Academician 1880; third-class medal, Paris Exposition, 1889. Many of his scenes are taken from Surrey, and his *Heart of Surrey* (1874) is one of his best works. D. in London, Apr. 6, 1893. W. A. C.

Colebrooke, New Brunswick: See GRAND FALLS.

Colebrooke, HENRY THOMAS: Orientalist; b. in London, June 15, 1765; went to India in 1782, and was employed in the civil service of the East India Company. He became Professor of Sanskrit in the College of Fort William. He published a *Sanskrit Grammar* (1805); a *Dictionary of the Sanskrit Language* (1808); *Miscellaneous Essays* (2 vols., 1837); *On the Sacred Books of the Hindus*; and *Algebra of the Hindus*. His translation of *Sankhya Karika* was posthumously published. His works display sound critical judgment and great learning. D. in London, Mar. 10, 1837. See Max Müller, *Biographical Essays* (1884).

Coleman, CHARLES CARYLL: figure and landscape painter; b. in Buffalo, N. Y., 1840; associate National Academy, New York; has studied abroad, and has resided in Italy and France since 1866. Studio in Rome. W. A. C.

Coleman, LEIGHTON, D. D., LL. D.: b. in Philadelphia, May 3, 1837; graduated at the General Theological Seminary in New York city in June, 1861; settled as rector of the memorial church of St. Luke in Philadelphia; in 1863 became rector of St. John's church in Wilmington, Del.; three years later rector of St. Mark's church at Mauch Chunk, Pa., remaining there nearly eight years, when he removed to Toledo, O., assuming the rectorship of Trinity church. In 1875 he was elected Bishop of Fond du Lac, Wis., but declined. In 1888 he was consecrated Bishop of Delaware.

Coleman, LYMAN, D. D.: scholar, teacher, and author; b. at Middlefield, Mass., June 14, 1796; graduated at Yale 1817; traveled and studied in Europe and the East; was connected with several literary institutions and was Professor of Ancient Languages in Lafayette College, Easton, Pa., 1861–82. He published *Antiquities of the Christian Church* (New York, 1841); *Ancient Christianity Exemplified* (Philadelphia, 1852); *Historical Text-book and Atlas of Biblical Geography* (1854); *Prelacy and Ritualism* (1869); and other works. D. in Easton, Pa., Mar. 16, 1882.

Colenso, JOHN WILLIAM, D. D.: b. in St. Austell, Cornwall, England, Jan. 24, 1814; d. in Durban, Natal, Africa, June 20, 1883. He graduated from Cambridge, was appointed rector of Forncett St. Mary, Norfolk, in 1846, and enjoyed a reputation as a mathematician, some of his treatises being used as text-books in the schools and universities. In 1853 he was elected Bishop of Natal, and in 1855 he published *Ten Weeks in Natal* and in 1862 the first volume of *The Pentateuch*, etc. (7th and last part 1879), in which he called in question many of the statements of Moses and denied the inspiration of the Old Testament. The book was condemned by both Houses of Convocation, and the author was nominally deposed by Bishop Robert Gray, of Capetown, who claimed to be his metropolitan. This deposition was recognized by the Convocation of Canterbury, England, and by the General Convention of the American Episcopal Church. The Privy Council, however, ordered the income of his see and arrears to be paid to him, and a fund of $15,000 was raised in England and given to him. He was inhibited from preaching in several dioceses of England. He espoused the cause of the Zulus, and secured the sending of Cetewayo to Great Britain. In view of the legal complications attending the filling of the see of Natal, a bishop, in communion with the English and American Churches, was consecrated for Maritzburg, South Africa, comprising the territory of Natal. See his *Life* by G. W. Cox (London, 1888, 2 vols.; 2d ed. same year, 1 vol.). Revised by W. S. PERRY.

Coleop'tera [from Gr. κολεόπτερος, sheath-winged; κολεός, sheath + πτερόν, wing]: the largest order of true insects, commonly known as beetles. The Coleoptera have the mouth parts fitted for biting, the prothorax distinct, and the mesothorax and metathorax (see INSECTS) each bearing a pair of wings. The hinder pair of these are of use in flight (except in degenerate forms), while the anterior pair are hardened into protective covers (or elytra), which sheathe the other pair when at rest. The Coleoptera pass through a metamorphosis, there being distinct larval, pupal, and adult stages. From the economic standpoint the beetles may be grouped as injurious or beneficial. To the former belong all those forms which destroy human possessions. Thus the larvæ of many feed upon vegetable matter; the larvæ of the "June bugs" feed upon the roots of the grass, of the spring-beetles on various crops, while those

of the so-called long-horn beetles (*Cerambycidæ*) form the borers of various orchard and forest trees. Other larvæ feed upon animal matter. The bacon-beetles will eat hides or other animal matter; the carpet-beetles (buffalo-bugs) show great fondness for any woolen or silk material. The beneficial beetles aid man by destroying the injurious forms or by acting as scavengers in removing decaying animal or vegetable matter. The number of species of Coleoptera is enormous, over 100,000 species being already (1893) described. Probably the total number of existing species will aggregate 200,000. J. S. Kingsley.

Colepeper: See Culpeper.

Coleraine: a seaport-town of Ireland, in the county of Londonderry; on the right bank of the river Bann, 4 miles from its mouth, and 47 miles N. N. W. of Belfast (see map of Ireland, ref. 3–H). A fine stone bridge connects Coleraine with its suburbs on the opposite shore of the Bann. Vessels of 200 tons can go up to the town, and steamers ply to Liverpool and Glasgow. It has a court-house and a custom-house; also manufactures of fine linen fabrics called "coleraines," and of paper, soap, etc. Pop. 6,000.

Coleridge, Hartley: poet; son of Samuel T. Coleridge; b. near Bristol, Sept. 19, 1796, and brought up by Southey. He was a dreamy, wayward, and eccentric genius. He became a fellow of Oriel College in 1818, but he soon lost his fellowship by his intemperance. He published a volume of admired poems in 1833. Among his other works is *The Worthies of Yorkshire and Lancashire* (1835). He had marvelous conversational powers. D. Jan. 6, 1849.—A younger brother, Derwent, b. Sept. 14, 1800, was prebendary of St. Paul's Cathedral, had some reputation as a writer, and died Mar. 29, 1883. He published an edition of his brother's poems (1851).

Coleridge, Henry Nelson: a cousin of Hartley Coleridge; b. in 1800; was called to the bar in 1826; published an *Introduction to the Study of the Greek Classic Poets* (1830) and *The Table-talk of Samuel T. Coleridge* (1835). D. in London, Jan. 26, 1843.

Coleridge, John Duke, Lord: b. in London, 1821; son of John Taylor Coleridge; educated at Eton and at Balliol College, Oxford; called to the bar at the Middle Temple in 1846. He was appointed recorder of Portsmouth 1855, created a queen's counsel in 1861, and became attorney-general in 1871, lord chief justice of the court of common pleas in 1873, and lord chief justice of England in 1880. He was made Baron Coleridge of Ottery St. Mary in 1873. D. in London, June 14, 1894. Revised by F. Sturges Allen.

Coleridge, John Taylor, D. C. L.: British jurist and author; nephew of S. T. Coleridge; b. at Tiverton in 1790. In 1812, after a brilliant career at Oxford University, where he became the intimate friend of John Keble, he took the degree of B. A.; was called to the bar at the Middle Temple in 1819; appointed serjeant-at-law and recorder of Exeter in 1832, justice in the King's Bench in 1835, and sworn of the Privy Council in 1858. He was a sound and fair-minded but not a great lawyer, and a literary critic of high reputation. He edited one of the best editions of *Blackstone's Commentaries* (1825), and wrote a life of *John Keble* (1869). D. at Heath's Court, Ottery St. Mary, Feb. 11, 1876.
Revised by F. Sturges Allen.

Coleridge, Samuel Taylor: an English poet and critic; b. at Ottery St. Mary, in Devonshire, Oct. 21, 1772; son of the vicar of that parish. In 1791 he entered Jesus College, Cambridge, where he attained great proficiency in classical learning. He abruptly quitted Cambridge in 1792, and enlisted in a regiment of dragoons under the assumed name of Silas Tomken Comberbatch. His relatives soon procured his discharge from the army. He visited Bristol in 1794, and became an associate of Robert Southey and other young men who, like himself, had adopted democratic and revolutionary ideas. They formed a project to emigrate to the banks of the Susquehanna and to found a "pantisocracy," in which they proposed to enjoy a community of goods. As they could not raise money enough for the outfit, they were compelled to abandon the enterprise. His friend and patron, Joseph Cottle, of Bristol, paid him thirty guineas in advance for a volume of poems (published in 1796). In 1795 he married Sarah Fricker, whose sister, Edith, soon after married Southey, and became a resident of Nether Stowey, Somersetshire, where he associated with the poet Wordsworth, and remained nearly three years. During this period he composed the *Ancient Mariner* and other poems. Coleridge and Wordsworth wrote in partnership a collection of *Lyrical Ballads*. He held Socinian views in this early part of his mature life, and began to preach in the Unitarian churches, but his success as a preacher was hindered by his instability and want of punctuality. In 1798 he visited Germany with Wordsworth, and studied at Göttingen. He removed to Keswick, in the lake country, in 1801, and resided with Southey and Wordsworth. The unfriendly critics of the reviews applied to these three friends the appellation of "Lake Poets," in reference to their local habitation. In 1808 he lectured on poetry and the fine arts in London, and in 1809 commenced the publication of the *Friend*, a periodical. His wife and family remained at Keswick, dependent on Southey, while Coleridge led a wandering life and formed many speculative and literary projects, which he failed to realize. His natural infirmities of character were increased by the use of opium. He passed many of his later years in the house of Mr. Gillman, at Highgate, near London, where he began to reside in 1816. Coleridge was the first to introduce to English readers some of the valuable points of German philosophy. Before his time only vague traditions of that philosophy had arrived and mere caricatures of it had been published. He has been truthfully called the creator of the higher criticism in England, which had accomplished so much in Germany in the hands of Lessing and Goethe. His *Aids to Reflection* (1825) stimulated a profounder method of thinking in England and America. His distinction between reason and the understanding may be said to have given rise to the transcendental school of New England. Among his other works are *Christabel* (1816); *Zapolya*, a drama (1818); *Literary Remains* (1836); *Biographia Literaria* (1847). *Osorio, a Tragedy* (first printed in 1873), was the original drama from which his *Remorse* was adapted. D. at Highgate, July 25, 1834. See Gillman, *Life of S. T. Coleridge* (1838); Cottle, *Reminiscences of Coleridge and Southey* (1847). Revised by W. T. Harris.

Coleridge, Sara Henry: only daughter of Samuel Taylor Coleridge; b. at Keswick, Dec. 22, 1802. She passed many of her early years in the house of her uncle, Robert Southey, and was married in 1829 to her cousin, Henry N. Coleridge. She edited several works of her father, and wrote an admired imaginative tale called *Phantasmion* (1837). D. May 3, 1852. Her memoirs and letters, edited by her daughter, were published in 2 vols., 1873.

Colet, John: Dean of St. Paul's and founder of St. Paul's School; b. in London, 1466: son of Sir Henry Colet, a wealthy merchant and mayor of the city; educated first in London, then in the University of Oxford, about 1483, and probably at Magdalen College. About 1493 he set out for the Continent, and studied in the universities of France and Italy. Returning to England he lectured gratuitously on theological subjects in Oxford, where he made the acquaintance of Erasmus and Sir Thomas More. Ordained deacon in Dec., 1497, he held various preferments, and was in 1505 made Dean of St. Paul's, where he acquired great influence by his preaching. On the death of his father he inherited a considerable property, and in the year 1509 he set about founding St. Paul's School, which, according to the statutes, was actually founded in 1512. The founding of St. Paul's was a great fact in the history of education, because this school was the first in England in which Greek became a regular part of the curriculum. William Lily, whom Colet had met in Rome, was appointed the first head master. Colet and Lily compiled together a famous Latin grammar, which became the foundation of the celebrated Eton grammar. Erasmus also wrote a phrase-book for the new school. Colet endowed the school with the greater part of his considerable fortune. In regard to the methods of classical instruction, he held that "Latin speech was before the rules and not the rules before the Latin speech." Best biography, *Life of John Colet*, by the Rev. J. H. Lupton (London, 1887). See also Joseph Payne's *Lectures on the History of Education* (new ed. 1892).

Colfax: capital of Whitman co., Wash. (for location of county, see map of Washington, ref. 5–J); on Union Pac. R. R., 85 miles S. of Spokane; has an academy. Pop. (1880) 444; (1890) 1,649; (1900) 2,121.

Colfax, Schuyler: statesman; b. in the city of New York, Mar. 23, 1823; was a grandson of Gen. William Colfax, who commanded Washington's Life Guards. In 1836 he removed with his mother, who was then a widow, to Northern Indiana. He settled at South Bend and studied law,

and became in 1845 editor of the *St. Joseph Valley Register*, a Whig paper issued at South Bend. In 1850 he was a member of the convention which formed a new constitution for Indiana, and he opposed the clause that prohibited colored men from settling in that State. As a Whig candidate for Congress he was defeated in 1851, but was elected in 1854; was six times re-elected, and continued to represent that district until 1869. In 1856 he made an eloquent speech in Congress on the subject of the conflict in Kansas. He was chosen Speaker of the House of Representatives in Dec., 1863 and again in 1865 and 1867. During the civil war he was a friend and confidential adviser of President Lincoln. In Nov., 1868, he was elected Vice-President of the U. S. by the Republicans on the ticket with Gen. Grant. Mr. Colfax died Jan. 13, 1885. A bronze statue of him, erected in University Park, Indianapolis, Ind., by the Odd Fellows, was unveiled May 18, 1887.

Colgate, James Boorman: philanthropist; b. in New York city, Mar. 4, 1818; prepared for college, but decided on a business career; after experience in the wholesale dry-goods business in the firm of Colgate & Abbe, formed a partnership with John B. Trevor. The firm entered Wall Street in 1852 as dealers in stocks and other securities, and for many years did the largest stock and bullion business in Wall Street. Mr. Colgate has been for many years a prominent advocate of the remonetization of silver. Apart from his business, he is known for his connection with educational interests and Christian benevolence. Since 1861 he has been prominently identified with Colgate (formerly Madison) University, to which he has given the academy building, the library building, and an endowment of a million dollars known as the Dodge Memorial Fund. He has also given largely to other educational and benevolent institutions.

C. H. Thurber.

Colgate, Samuel: philanthropist; b. in New York city, Mar. 22, 1822; president of the New York Baptist Education Society for twenty-nine years; trustee of Colgate University for thirty years; member of the finance committee of the American Tract Society for twenty-four years; president of the Society for the Suppression of Vice for eighteen years; member of the executive committee of the American Baptist Missionary Union for twenty-nine years. Mr. Colgate spent much time in collecting the documentary history of the Baptist denomination, and brought together 30,000 volumes of reports, which are preserved in the library of Colgate University. D. at Orange, N. J., April 23, 1897.

Colgate University: an institution of learning located at Hamilton, N. Y.; had its origin in 1820, when the Hamilton Literary and Theological Seminary was opened, with Rev. Daniel Hascall, A. M., as principal. Vigorous growth caused expansion, until in 1834 three distinct courses were developed—preparatory, collegiate, and theological. The first collegiate class was that of 1835. The charter, under the name of Madison University, was obtained in 1846. A removal controversy ensued in 1847 and terminated in 1850. Up to this time the institution had been without endowment.

The first president, Dr. Nathaniel Kendrick, having died in 1848, was succeeded in 1851 by Dr. Stephen W. Taylor, and upon his death in 1856 Dr. George W. Eaton became president. Under each the university gained strength, but funds grew slowly. To the earlier buildings were added West College (1827), East College (1834), and Alumni Hall (1861); but up to 1864 the endowment was only $52,000. Between 1865 and 1868 about $100,000 more was secured.

During the administration of President Ebenezer Dodge (1868–90) funds increased to more than $500,000. Dr. P. B. Spear was treasurer 1864–88. Departments were added, facilities improved and multiplied. A separate building for the preparatory school (Colgate Academy) was erected in 1873, a chemical laboratory for the college in 1884, and Eaton Hall for the theological department (Hamilton Theological Seminary) in 1886. A fireproof library building, costing $150,000, was erected in 1889 by James B. Colgate, of New York. In recognition of the munificence of the Colgate family, the trustees at their meeting in 1889 voted to change the name of the institution to Colgate University. This act was approved by the alumni, and was legally ratified Apr. 22, 1890.

At the commencement in 1891 Mr. James B. Colgate added $1,000,000 to the endowment, as the Dodge Memorial Fund, in tribute to President Dodge, who died Jan. 5, 1890. This enlargement of financial resources affords assurance of stability and growth. In 1899–1900 the university (college proper) had 16 professors and 131 students; Colgate Academy had 9 instructors and 141 students; Hamilton Theological Seminary had 8 professors and 49 students. George E. Merrill, D. D., was chosen president Dec. 20, 1898.

Colhoun′. Edmund R.: rear-admiral U. S. navy; b. in Pennsylvania, May 6, 1821, ; entered the navy as a midshipman Apr. 1, 1839. He served on the east coast of Mexico during the Mexican war; commanded the steamer Hunchback and rendered efficient aid at the capture of Roanoke island and Newbern, N. C., in 1862; was in several engagements with batteries on Black Water river, Va., during the autumn of that year; commanded the monitor Weehawken during the summer and autumn of 1863 in her various engagements with the forts and batteries of Charleston harbor. Retired May 6, 1883. D. Feb. 17, 1897.

Colic [from Gr. κωλικός, pertaining to the colon (κῶλον)]: a term applied to diseases attended with severe pain of the abdomen; the supposed particular connection of the pain with the large intestine is not always certain. The disease is caused, at least in part, by irregular contractions of the muscular coat of the intestines. Several causes may lead to the production of intestinal colic, such as irritating food, in which case castor oil or similar quick purgatives bring relief; or cold may cause a true neuralgia of the intestines; or lead-poisoning may lead to violent spasmodic colic. Painful affections of other abdominal organs are also spoken of as colics—as "renal colic," the form dependent on passage of a stone from the kidney, or "hepatic colic," the painful discharge of gall-stones. Intestinal colic is technically called "enteralgia." The pain of colic is spasmodic, centers about the navel, and is often very greatly relieved by pressure, so that the patient may lie over the back of a chair for relief. When colic resists mild and simple remedies, medical assistance should be procured, for colic is closely allied, as a symptom, to several severe and dangerous diseases.

Revised by William Pepper.

Coligny, kō′lĕĕn′yĕ′, Gaspard de Châtillon, Count: French admiral and Huguenot; b. at Châtillon-sur-Loing, Feb. 16, 1517; served with distinction at the battle of Cérisoles 1544; became admiral of France 1552; taken prisoner by the Spaniards at St.-Quentin in 1557; second in command of the Protestant army in the civil war which began 1562; when the Prince of Condé was killed at Jarnac in 1569 he succeeded him as commander-in-chief. The war was suspended in 1570 by a treaty of peace, in which the court acted a treacherous part. Coligny went to Paris to attend the marriage of Henry of Navarre in Aug., 1572, and was received with feigned kindness by Charles IX. He was wounded in the street by a partisan of the Duke of Guise, and was killed, two days later (Aug. 24), in the general massacre of St. Bartholomew. See Pérault, *Vie de Coligni*; Brantôme, *Discours sur l'Amiral de Châtillon*; Dufey, *Coligny, Histoire Française* (4 vols., 1824); and biographies by Delaborde (1880) and Bersien (early life only, 1885, Eng. trans.).

Colima: a western state of Mexico; between Jalisco on the N., Michoacan on the S. E., and the Pacific on the S. W. Area, 2,704 sq. miles. Principal port, Manzanillo. The northeastern part is in the Sierra Madre, and the Nevado de Colima, on the boundary, is one of the highest peaks in Mexico (14,364 feet). The volcano of the same name attains 12,743 feet. The southwestern part of the state is lower, but much diversified by mountain-ridges, with fertile and well-watered valleys between. Colima, though one of the smallest Mexican states, leads many of the others in enterprise and prosperity. It is one of the principal coffee regions; sugar-cane, cotton, rice, and indigo are largely grown, and the manufactures, especially of cotton cloth, are important. Pop. (1895) 55,677. Capital, Colima.

Herbert H. Smith.

Colima: city of Mexico; capital of the state of same name; in a fertile plain; 80 miles from the port of Manzanillo (see map of Mexico, ref. 7–F). It is a center of the cotton-manufacturing industry, and has several thriving mills. The streets are regularly laid out, and the residences, often of more modern style than is usual in Mexico, are adorned with tasty courts and gardens. Colima was founded by order of Cortés about 1523. Pop. (1895) 19,305.

Herbert H. Smith.

Colise′um, or Colosse′um [from Lat. *colosseus*, colossal]: the Flavian Amphitheater in Rome, dedicated A. D. 80, now

one of the most magnificent ruins in the world. See AMPHITHEATER.

Colladon, DANIEL: civil engineer and savant; b. in Geneva, Switzerland, in 1802, where he studied and wrote until 1825, when he went to Paris, remaining ten years. He invented the rock drill operated by compressed air for the Mont Cenis tunnel, and was employed as consulting engineer for the St. Gothard tunnel. He wrote on almost every department of physics; was a correspondent of the Institute of France, of the Royal Academy of Sciences, Turin, member of the Geological Society of Vienna, officer of the Legion of Honor, and commander of the order of St. Maurice and Lazarus. D. in Geneva, June 20, 1893.

Col'lamer, JACOB, LL. D.: lawyer and U. S. Senator; b. in Troy, N. Y., in 1792; removed to Vermont in his youth; graduated in 1810 at the University of Vermont; admitted to the bar in 1812. He became eminent in his profession, and was a judge of the Supreme Court of Vermont from 1833 to 1841; member of Congress in 1843, 1844, and 1846, and was appointed Postmaster-General by President Taylor in Mar., 1849. In July, 1850, he resigned in consequence of the death of Taylor. He was elected a U. S. Senator in 1854, and re-elected in 1860. D. Nov. 9, 1865.

Collao, kōl-yaă'ō: that portion of Southern Peru which lies within the Titicaca basin, or which would be defined by an irregular line, including the heads of all the Peruvian streams which flow into the lake. It consists of elevated plains nowhere less than 12,000 feet high and bordered by lofty mountain-chains. The Collao is included in the modern department of Puno. HERBERT H. SMITH.

Collateral Inheritance Tax: See INHERITANCE TAX, in the Appendix.

College [from Lat. *colle'gium*, a body of colleagues, a fraternity]: originally a body of persons associated together for the purpose of performing common functions; a body of colleagues. Under Roman law there were the colleges of augurs, of pontiffs, of tribunes, and of artisans. In mediæval and modern times the term has been applied in a similar manner to bodies quite dissimilar in their purposes. Thus it is common to speak of the college of bishops, the college of cardinals, and the college of presidential electors. But it is in educational matters that the term has come to have the most marked and important significance.

It is probable that colleges organized for academic purposes had their origin about the end of the twelfth century at the University of Paris, where persons at the university who had common ends in view associated themselves together for a mutual advantage. A little later the term was applied to institutions of learning in other countries. In Germany and Italy, however, the term *collegium* did not, as in England, come to be applied to institutions or corporations, but only to associations of scholars coming together simply in a voluntary capacity. It was in England that the word came to have its most important significance. In the thirteenth century colleges were established in considerable numbers at Oxford and Cambridge; and these institutions were bound together in what we know as the university. It is probable that the origin of the college in England was not unlike that in France. Students went to the universities in large numbers and for different purposes, and found it convenient to separate into groups of persons having a common end in view. It is recorded that at one time the number of students at Oxford was 30,000; the number of halls occupied by students 300. As time passed on the aggregation of students in buildings where they could at once advance their common interests and receive protection in their common and personal rights was encouraged by princes and bishops, as well as by private benefactors. In this way the group of buildings known as the colleges at Oxford and Cambridge came into existence. The colleges at Oxford, with the dates of their foundations, are the following: All Souls, 1437; Balliol, 1262; Brasenose, 1509; Christ Church, 1525; Corpus Christi, 1516; Exeter, 1413; Hertford, 1874; Jesus, 1571; Keble, 1870; Lincoln, 1427; Magdalen, 1456; Mansfield, 1888; Merton, 1264; New, 1380; Oriel, 1324; Pembroke, 1624; Queen's, 1340; St. John's, 1555; Trinity, 1555; University, 1249; Wadham, 1610; Worcester, 1283. Those at Cambridge are the following: Caius, 1348; Catharine, 1473; Cavendish, 1873; Clare, 1326; Christ's, 1439; Corpus Christi, 1352; Downing, 1717; Emmanuel, 1584; Jesus, 1496; King's, 1441; Magdalene, 1542; Pembroke, 1348; Queen's, 1448; St. John's, 1510; St. Peter's, 1257; Selwyn, 1882; Sidney-Sussex, 1596; Trinity, 1546; Trinity Hall, 1350. The college in England is not so much an institution for teaching as one for furnishing a residence for students where they will be surrounded with the most encouraging and inspiring opportunities. Formerly all students were required to live in the dormitories furnished by the college, and to take their meals at the common table or college hall. Those who, on account of distinguished attainments, were appointed after graduation to fellowships were required also to occupy rooms in the college and eat at the common table. Until recently the fellows forfeited their fellowships in case of marriage. In the colleges at Oxford and Cambridge the student is entirely at liberty to seek whatever instruction he may choose, but, if he is a candidate for a degree, regularity of work is generally secured by the knowledge that success in his final examinations will depend very largely upon the excellence of his instruction, as well as upon his own diligence. Students of any college may take instruction in any other. The colleges of Oxford and Cambridge hold no examinations. Students, when prepared for final examinations for a degree, must apply to the university, the special function of which is to hold examinations and grant degrees. The course of undergraduate study at an English college ordinarily continues about three years. The number of students in all the colleges at Oxford is usually about 3,500; in Cambridge the number is slightly less.

Colleges in the U. S. were founded on the English model. Among the early settlers of Massachusetts a large number of influential men received their education at Emmanuel College, Cambridge. Harvard College, founded in 1636, was organized in imitation of Emmanuel; the College of William and Mary, in Virginia, and Yale College, in Connecticut, imitated the organization of Harvard; and they in turn were imitated by the colleges established during the next 150 years. In England students offering themselves for degrees were formerly examined for the most part either in the ancient classics or in the mathematics. This fact gave great preponderance to those studies. The training was purely disciplinary and preliminary to professional study. The same was true in the colleges of the U. S. that were organized on the English model.

Early in the nineteenth century, however, there began to be not a little distrust of this method of organization. President Wayland, of Brown University, at Providence, R. I., and President Nott, of Union College, Schenectady, N. Y., were pioneers in the general movement that now took place. Soon after 1850 President Barnard, of Columbia College, published elaborate statistics, the result of careful investigations, which showed conclusively that the proportion of students going to college in the U. S. was steadily growing less and less. This tendency was believed by very many to be the result of a deep-seated and wide-spread dissatisfaction with the limited range of studies offered by the ordinary college. In 1852 Dr. Henry P. Tappan, on entering upon the duties of his office as president of the University of Michigan, boldly proclaimed the doctrine that science, the modern languages, and history were entitled to the same prominence in the college curriculum that should be given to the ancient languages and the mathematics. On this theory the college of literature, science, and the arts was remodeled. The success of the university seemed to justify the change, and the newly modified course of study became the model in the organization of the other State universities. The spirit which led to this change in the course of a few years also very greatly modified the colleges that had been established on the old model. While Greek, Latin, and the mathematics continued to have a dominant influence in the first two years of the course, the modern languages and the natural sciences, as well as history, economics, and the modern literatures, forced their way into the arrangement of courses for the third and fourth years. Technical studies also pressed for recognition. Colleges of engineering, agriculture, and architecture were established. Some of these formed a part of institutions already established, and some were established on an independent basis. From every point of view, however, it was apparent that the old exclusiveness was giving way, and a modern method was taking its place. The natural consequence of this movement was that great variety and even chaos ensued. Some of those in charge of colleges were conservative; others were fond of change. The former very generally adhered to the classical model, the latter as generally advocated the introduction of what were called studies of modern importance. There is therefore a marked

absence of uniformity both in the requirements for admission to college and in the studies pursued by collegiate students. In general it may be said, however, that the requirements for admission have been steadily increased, and that the average age at which students are now admitted to college is about two years greater than it was about the middle of the nineteenth century. Meantime the number of colleges has multiplied even more rapidly than the population of the country. Throughout the Middle and Western States young women are generally admitted to the same colleges as men. In the Eastern and Southern States such is ordinarily not the case. For the education of women, however, generous provisions have been made. The most prosperous of the colleges established for women alone are Vassar College, at Poughkeepsie, N. Y., Wellesley College, at Wellesley, Mass., Smith College, at Northampton, Mass., Mt. Holyoke College, at South Hadley, Mass., and Bryn Mawr College, at Bryn Mawr, Pa.

The college in the U. S. is sometimes identical with the university. For example, Columbia College and the College of New Jersey are in the true sense of the term universities. With no more than a few exceptions, the university is but an aggregation of colleges. The name "university," however, has often been ambiguously applied to small institutions whose hopes of greatness were larger than their prospects.

TABLE OF COLLEGES IN THE UNITED STATES.

The following list of colleges, compiled from the most authentic sources, and arranged alphabetically by States and colleges, has been brought down to the year 1893. In some cases the figures have been taken from the latest report of the Commissioner of Education; in others they have been obtained by direct inquiry:

NAME.	Location.	Denomination.	Chartered.	Opened.
Alabama, University of..	University, Ala.	Non-sect.	1819	1819
Howard College	East Lake, "	Baptist	1843	1841
Selma University	Selma, "	"	1881	1878
Southern University.....	Greensborough, "	M. E. So.	1856	1859
Spring Hill College	Near Mobile, "	R. C.	1836	1830
Arkansas College.....	Batesville, Ark.	Presbyterian	1872	1872
Arkansas Industrial Univ.	Fayetteville, "	Non-sect.	1871	1872
Cane Hill College.....	Boonsborough, "	Cumb. Presb.	1851	1852
Little Rock University...	Little Rock, "	M. E.	1883	1882
Philander Smith College.	" " "	"	1883	1877
California College	Oakland, Cal.	Baptist	1874	1874
California, University of.	Berkeley, "	Non-sect.	1868	1869
Hesperian College.....	Woodland, "	Christian	1860	1860
Leland Stanford Junior University	Palo Alto, "	Non-sect.	1885	1891
Napa College	Napa City, "	M. E.	1885	1886
Pacific Methodist College	Santa Rosa, "	M. E. So.	1862	1861
Pierce Christian "	College City, "	Christian	1874	1874
St. Augustine "	Benicia, "	P. E.	1867	1867
St. Ignatius "	San Francisco, "	R. C.	1859	1855
St. Mary's "	" " "	"	1872	1863
St. Vincent's "	Los Angeles, "	"	1869	1867
San Joaquin Valley "	Woodbridge, "	U. B.	1883	1879
Santa Clara "	Santa Clara, "	R. C.	1855	1851
Univ. of South California	Los Angeles, "	M. E.	1880	1881
University of the Pacific.	College Park, "	"	1855	1854
Colorado College	Colorado Sps., Col.	Non-sect.	1873	1874
Colorado, University of..	Boulder, "	"	1876	1877
Denver, University of....	Denver, "	M. E.	1864	1880
Presbyterian College of the Southwest	Del Norte, "	Presbyterian	1883	1883
Trinity College	Hartford, Conn.	P. E.	1823	1824
Wesleyan University	Middletown, "	M. E.	1831	1831
Yale University.....	New Haven, "	Non-sect.	1701	1701
Delaware College.....	Newark, Del.	"	1833	1834
American University	Washington, D. C.	M. E.	1891	....
Columbian University...	" "	Non-sect.	1821	1821
Georgetown College.....	" "	R. C.	1815	1789
Gonzaga "	" "	"	1858	1821
Howard University.....	" "	Non-sect.	1867	1867
National Deaf Mute Coll.	" "	"	1864	1864
Catholic Univ. of America	" "	R. C.	1885	1889
Florida Conference Coll.	Leesburgh, Fla.	M. E. So.	1886	1886
John B. Stetson Univ....	De Land, "	Baptist	1887	1883
Rollins College.....	Winter Park, "	Cong.	1885	1885
St. John's River Conference College	Orange City, "	M. E.	1887	1887
Atlanta University..... ..	Atlanta, Ga.	Non-sect.	1869	1869
Bowdon College	Bowdon, "	"	1857	1856
Clark University.....	Atlanta, "	M. E.	1877	1869
Emory College.....	Oxford, "	M. E. So.	1836	1837
Georgia, University of...	Athens, "	Non-sect.	1784	1801
Mercer University.....	Macon, "	Baptist	1837	1838
Pio Nono College	" "	R. C.	1876	1874
Augustana College	Rock Island, Ill.	Lutheran	1865	1860
Blackburn University....	Carlinville, "	Presbyterian	1857	1859
Carthage College.....	Carthage, "	Lutheran	1870	1870
Chaddock "	Quincy, "	M. E.	1876	1876
Chicago, University of...	Chicago, "	Baptist	1890	1892
Eureka College.....	Eureka, "	Christian	1855	1849
Evangelical Proseminary	Elmhurst, "	Ger. Ev.	1869	1870
Ewing College	Ewing, Ill.	Baptist	1867	1868
German-English College.	Galena, "	M. E.	1880	1868
Hedding College.....	Abingdon, "	"	1875	1855
Illinois "	Jacksonville, "	Non-sect.	1835	1830
Illinois, University of....	Urbana, "	"	1867	1868
Illinois Wesleyan Univ...	Bloomington, "	M. E.	1853	1853
Knox College	Galesburgh, "	Non-sect.	1837	1841
Lake Forest University..	Lake Forest, "	Presbyterian	1856	1876
Lincolu University.....	Lincoln, "	C. Presb.	1865	1866
Lombard "	Galesburgh, "	Universalist	1853	1853
McKendree College.....	Lebanon, "	M. E.	1834	1834
Monmouth "	Monmouth, "	U. Presb.	1857	1856
Mt. Morris "	Mt. Morris, "	Ger. Baptist	1840	1840
Northern Illinois College.	Fulton, "	Non-sect.	1866	1866
Northwestern College ...	Naperville, "	Ev. Ass'n	1865	1861
Northwestern University	Evanston, "	M. E.	1851	1855
St. Francis Solanus Coll.	Quincy, "	R. C.	1873	1860
St. Ignatius College.....	Chicago, "	"	1870	1870
St. Joseph's Dioc. Coll...	Teutopolis, "	"	1881	1862
St. Viateur's College.....	Bourbonnais Gr., "	"	1874	1865
Shurtleff College	Upper Alton, "	Baptist	1835	1827
University of Chicago...	Chicago. "	"	1890	1892
Westfield College.....	Westfield, "	U. B.	1865	1865
Wheaton "	Wheaton, "	Cong.	1860	1860
Butler Uuiversity.....	Irvington, Ind.	Christian	1850	1855
Concordia College.....	Fort Wayne, "	Lutheran	1850	1839
De Pauw University	Greencastle, "	M. E.	1837	1837
Earlham College.....	Richmond, "	Friends	1859	1847
Fort Wayne "	Fort Wayne, "	M. E.	1847	1848
Franklin "	Franklin, "	Baptist	1844	1837
Hanover "	Hanover, "	Presbyterian	1832	1828
Hartsville "	Hartsville, "	U. B.	1851	1850
Indiana Unlversity	Bloomington, "	Non-sect.	1820	1824
Moore's Hill College.....	Moore's Hill, "	M. E.	1854	1856
Notre Dame, Univ. of....	Notre Dame, "	R. C.	1844	1845
Ridgeville College	Ridgeville, "	F.-W. Baptist	1867	1867
St. Bonaventure's Coll...	Terre Haute, "	R. C.	....	....
St. Meinrad's College....	St. Meinrad, "	"	....	1857
Union Christian College .	Merom, "	Christian	1859	1861
Wabash College	Crawfordsville, "	Presbyterian	1834	1833
Amity "	College Sps., Iowa	Non-sect.	1856	1871
Central Univ. of Iowa ...	Pella, "	Baptist	1853	1853
Coe College.....	Cedar Rapids, "	Presbyterian	1881	1881
Cornell College	Mt. Vernon, "	M. E.	1857	1857
Des Moines College	Des Moines, "	Baptist	1865	1866
Drake University.....	" " "	Christian	1881	1881
German College	Mt. Pleasant, "	M. E.	1873	1873
Griswold "	Davenport, "	P. E.	1859	1859
Iowa "	Grinnell, "	Cong.	1847	1848
Iowa, State University of	Iowa city, "	Non-sect.	1847	1860
Iowa Wesleyan Univ.....	Mt. Pleasant, "	M. E.	1855	1855
Lenox College	Hopkinton, "	Presbyterian	1856	1859
Luther "	Decorah, "	Lutheran	1865	1861
Oskaloosa College	Oskaloosa, "	Christian	1855	1862
Parsons "	Fairfield, "	Presbyterian	1875	1875
Penn "	Oskaloosa, "	Friends	1873	1873
St. Joseph's "	Dubuque, "	R. C.	...	1873
Simpson "	Indianola, "	M. E.	1867	1867
Tabor "	Tabor, "	Cong.	1866	1857
Upper Iowa University ..	Fayette, "	M. E.	1862	1857
Wartburg College	Waverly, "	Lutheran	1885	1868
Western "	Toledo, "	U. B.	1856	1856
Baker University	Baldwin, Kan.	M. E.	1858	1858
Bethany College.....	Lindsborg, "	Lutheran	1883	1881
Campbell University	Holton, "	Non-sect.	....	1882
Central College.....	Enterprise, "	U. B.	....	1891
Cooper Memorial Coll...	Sterling, "	U. Presb.	....	1887
Emporia, College of	Emporia, "	Presbyterian	1882	1883
Garfield University.....	Wichita, "	Christian	1886	1887
Highland "	Highland, "	Presbyterian	1857	1857
Kansas, University of ...	Lawrence, "	Non-sect.	1864	1866
Kansas Wesleyan Univ..	Salina, "	M. E.	1885	1886
Lane University.....	Lecompton, "	U. B.	1865	1865
Midland College	Atchison, "	Lutheran	1887	1887
Ottawa University.....	Ottawa, "	Baptist	1863	1871
St. Benedict's College....	Atchison, "	R. C.	1868	1859
St. Mary's College.....	St. Mary's, "	"	1869	1870
Washburn "	Topeka, "	Cong.	1865	1865
Berea College.....	Berea, Ky.	Non-sect.	1865	1855
Bethel "	Russellville, "	Baptist	1856	1854
Central University.....	Richmond, "	So. Presb.	1873	1874
Centre College.....	Danville, "	Presbyterian	1819	1821
Concord "	New Liberty, "	Baptist	1868	1868
Eminence College.....	Eminence, "	Christian	1856	1857
Georgetown "	Georgetown, "	Baptist	1829	1850
Kentucky Classical and Business College.....	N. Middletown, "	Christian	1878	1877
Kentucky Military Inst..	Farmdale, "	Non-sect.	1847	1845
Kentucky University	Lexington, "	Christian	1858	1859
Kentucky Wesleyan Coll.	Millersburgh, "	M. E. So.	1860	1866
Murray Male and Female Institute...	Murray, "	Non-sect.	1871	1871
Ogden College.....	Bowling Green, "	"	1877	1877
St. Joseph's College	Bardstown, "	R. C.	1824	1819
St. Mary's "	St. Mary's, "	"	1837	1821
S. Kentucky "	Hopkinsville, "	Christian	1849	1849
Centenary "	Jackson, La.	M. E. So.	1835	1825
College of the Immaculate Conception.....	New Orleans, "	R. C.	1856	1847
Jefferson Coll.(St. Mary's)	Convent, "	"	....	1864
Keatchie College.....	Keatchie, "	Baptist	1856	1856
Leland University.....	New Orleans, "	"	1870	1874
Louisiana State Univ....	Baton Rouge, "	Non-sect.	1855	1860
New Orleans University.	New Orleans, "	M. E.	1873	1873
St. Charles College	Grand Coteau, "	R. C.	1852	1837

NAME.	Location.	Denomination.	Chartered.	Opened.
Southern University	New Orleans, La.	Non-sect.	1880	1880
Straight "	" " "	"	1869	1870
Thatcher Institute	Shreveport, "	"	1886	1871
Tulane Univ. of Louisiana	New Orleans, "	"	1884	1884
Bates College	Lewiston, Me.	F.-W. Baptist	1863	1863
Bowdoin College	Brunswick, "	Cong.	1794	1802
Colby University	Waterville, "	Baptist	1813	1818
Baltimore City College	Baltimore, Md.	Non-sect.	....	1839
Frederick College	Frederick, "	"	1829	1763
Johns Hopkins Univ.	Baltimore, "	"	1867	1876
Loyola College	" "	R. C.	1853	1849
Mt. St. Mary's College	Mt. St. Mary's P. O. "	"	1830	1808
New Windsor "	New Windsor, "	Non-sect.	1886	1843
Rock Hill "	Ellicott City, "	R. C.	1865	1857
St. Charles's "	" " "	"	1830	1848
St. John's "	Annapolis, "	Non-sect.	1784	1789
Washington "	Chestertown, "	"	1782	1782
Western Maryland Coll.	Westminster, "	M. P.	1868	1867
Amherst College	Amherst, Mass.	Cong.	1825	1821
Boston "	Boston, "	R. C.	1863	1863
Boston University	" "	M. E.	1869	1871
Clark "	Worcester, "	Non-sect.	1887	1889
College of the Holy Cross	" "	R. C.	1865	1843
Harvard University	Cambridge, "	Non-sect.	1650	1638
Massachusetts Agr. Coll.	Amherst, "	"	1863	1867
Mt. Holyoke Seminary and College	South Hadley, "	"	1836	1837
Smith College	Northampton, "	"	1871	1875
Society for the Collegiate Instruction of Women	Cambridge, "	"	1882	1879
Tufts College	College Hill, "	Universalist	1852	1855
Wellesley College	Wellesley, "	Non-sect.	1870	1875
Williams "	Williamstown, "	"	1793	1793
Adrian "	Adrian, Mich.	M. P.	1859	1859
Albion "	Albion, "	M. E.	1861	1861
Battle Creek "	Battle Creek, "	7th-D. Ad.	1874	1874
Detroit "	Detroit, "	R. C.	1881	1879
Graud Traverse College	Benzonia, "	Cong.	1863	1862
Hillsdale College	Hillsdale, "	F.-W. Baptist	1855	1855
Hope "	Holland, "	Reformed	1866	1862
Kalamazoo "	Kalamazoo, "	Baptist	1833	1833
Michigan, University of	Ann Arbor, "	Non-sect.	1837	1841
Olivet College	Olivet, "	Cong.	1859	1859
Augsburg Seminary	Miuneapolis, Minn.	Lutheran	....	1869
Carleton College	Northfield, "	Cong.	1866	1870
Dr. Martin Luther College	New Ulm, "	Lutheran	....	1884
Hamliue University	Hamline, "	M. E.	1854	1854
Macalester College	Macalester, "	Nou-sect.	1853	1885
Minnesota, University of.	Minneapolis, "	"	1851	1869
St. John's University	Collegeville, "	R. C.	1857	1857
St. Olaf College	Northfield, "	Lutheran	1874	1875
Alcorn Agr. and Mech. College	Rodney, Miss.	Non-sect.	1871	1871
Kavanaugh College	Holmesville, "	"	1885	1884
Mississippi "	Clinton, "	Baptist	1830	1830
Mississippi, University of	University, "	Non-sect.	1844	1848
Rust University	Holly Springs, "	M. E.	1870	1868
Tougaloo University	Tougaloo, "	"	1871	1869
Avalon College	Avalon, Mo.	U. B.	1869	1872
Central "	Fayette, "	M. E. So.	1857	1857
Central Wesleyan Coll.	Warrenton, "	Ger. M. E.	1865	1864
Christain University	Canton, "	Christian	1853	1857
Christain Brothers, College of	St. Louis, "	R. C.	1855	1851
Drury College	Springfield, "	Cong.	1873	1873
Grand River College	Edinburgh, "	Baptist	1845	1845
La Grange "	La Grange, "	"	1859	1866
Lewis "	Glasgow, "	M. E.	1867	1867
Lincoln "	Greenwood, "	U. Presb.	1870	1869
Missouri, Univ. of State of	Columbia, "	Non-sect.	1839	1840
Morrisville College	Morrisville, "	M. E. So.	1876	1872
Pike County "	Bowling Green, "	Non-sect.	1887	1881
Pritchett School Institute	Glasgow, "	"	1868	1866
St. Louis University	St. Louis, "	R. C.	1832	1829
St. Vincent's College	Cape Girardeau, "	"	1843	1843
Scarritt Collegiate Inst.	Neosho, "	M. E. So.	1888	1888
Southwest Baptist Coll.	Bolivar, "	Baptist	1879	1878
Stewartsville College	Stewartsville, "	Non-sect.	1879	1863
Tarkio College	Tarkio, "	U. Presb.	1885	1884
Washington University	St. Louis, "	Non-sect.	1853	1859
Westminster College	Fulton, "	Presbyterian	1832	1832
William Jewell College	Liberty, "	Baptist	1849	1850
Montana, College of	Deer Lodge, Mont.	Presbyterian	1884	1883
Bellevue College	Bellevue, Neb.	"	1880	1883
Creighton "	Omaha, "	R. C.	1879	1879
Doane "	Crete, "	Cong.	1872	1873
Gates "	Neligh, "	"	1881	1881
Nebraska Central College	Central City, "	Non-sect.	1885	1885
Nebraska, University of.	Lincoln, "	"	1869	1871
Nebraska Wesleyan Univ.	" "	M. E.	1887	1888
Nevada, State Univ. of	Reno, Nev.	Non-sect.	1862	1874
Dartmouth College	Hanover, N. H.	Coug.	1769	1770
Evelyn College	Princeton, N. J.	Non-sect.	....	1887
Princeton University	" "	"	1748	1746
Rutgers College	New Brunswick, "	Reformed	1766	1770
Sacred Heart, College of	Vineland, "	R. C.	1887	1885
St. Benedict's College	Newark, "	"	1881	1868
Seton Hall "	South Orange, "	"	1861	1856
Albuquerque "	Albuquerque, N. M.	M. E.	1887	1887
New Mexico, Univ. of	Santa Fé, "	Cong.	1881	1880
Alfred University	Alfred Centre, N. Y.	7th-D. Bapt.	1857	1857
Barnard College	New York, "	Non-sect.	1889	1889
Brooklyu Collegiate and Polytechuic Institute	Brooklyn, "	"	1854	1854

NAME.	Location.	Denomination.	Chartered.	Opened.
Canisius College	Buffalo, N. Y.	R. C.	1883	1870
City of New York, Coll. of	New York, "	Non-sect.	1847	1849
City of New York, Univ. of	" "	"	1831	1832
Colgate University	Hamilton, "	Baptist	1846	1819
Columbia College	New York, "	Non-sect.	1754	1754
Cornell University	Ithaca, "	"	1865	1868
Elmira College	Elmira, "	Presbyterian	....	1855
Hamilton College	Clinton, "	"	1812	1812
Hobart "	Geneva, "	P. E.	1825	1825
Ingham University	Le Roy, "	Presbyterian	1857	1837
Manhattan College	New York, "	R. C.	1863	1853
Niagara University	Niagara Univ., "	"	1883	1856
Rochester, University of.	Rochester, "	Baptist	1850	1850
St. Bonaventure's Coll.	Allegany, "	R. C.	1875	1859
St. Francis College	Brooklyn, "	"	1884	1859
St. Francis Xavier, Coll. of	New York, "	"	1861	1847
St. John the Baptist Coll.	Brooklyn, "	"	1873	1870
St. John's College	Fordhaiu, "	"	1846	1841
St. Joseph's "	Buffalo, "	"	....	1861
St. Lawrence University.	Canton, "	Universalist	1856	1859
St. Louis College	New York, "	R. C.	....	1869
St. Stephen's College	Annandale, "	P. E.	1860	1858
Syracuse University	Syracuse, "	M. E.	1870	1871
Union College	Schenectady, "	Non-sect.	1795	1795
Vassar College	Poughkeepsie, "	"	1861	1865
Wells "	Aurora, "	"	1867	1868
Biddle University	Charlotte, N. C.	Presbyterian	1877	1868
Davidson College	Davidson Coll., "	"	1837	1837
Livingstone College	Salisbury, "	A. M. E. Zion	1879	1880
North Carolina College	Mt. Pleasant, "	Lutheran	1859	1858
North Carolina, Univ. of.	Chapel Hill, "	Non-sect.	1789	1795
Rutherford College	Rutherford Coll. "	"	1853	1853
Shaw University	Raleigh, "	Baptist	1875	1865
Trinity College	Durham, "	M. E. So.	1858	1858
Wake Forest College	Wake Forest, "	Baptist	1838	1834
Weaverville "	Weaverville, "	M. E. So.	1870	1871
Fargo "	Fargo, N. Dak.	Cong.	1887	1887
North Dakota, Univ. of.	Grand Forks, "	Nou-sect.	1883	1884
Antioch College	Yellow Sps., Ohio	"	1852	1853
Ashland University	Ashland, "	Ger. Baptist	1878	1879
Baldwin "	Berea, "	M. E.	1856	1856
Belmont College	College Hill, "	Non-sect.	1846	1846
Buchtel "	Akron, "	Uuiversalist	1870	1872
Calvin "	Cleveland, "	Reformed	1883	1870
Capital University	Columbus, "	Lutheran	1850	1850
Cincinnati, University of.	Cincinnati, "	Non-sect.	1859	1875
Denison University	Granville, "	Baptist	1832	1836
Findlay College	Findlay, "	Church of God	1882	1883
Franklin "	New Athens, "	Non-sect.	1825	1821
German Wallace College.	Berea, "	M. E.	1864	1865
Heidelberg College	Tiffin, "	Reformed	1851	1850
Hiram "	Hiram, "	Christian	1867	1867
Kenyon "	Gambier, "	P. E.	1824	1825
Marietta "	Marietta, "	Non-sect.	1835	1835
Miami University	Oxford, "	"	1809	1816
Mt. Union College	Alliance, "	M. E.	1858	1846
Muskingum "	New Concord, "	U. Presb.	1837	1837
Oberlin "	Oberlin, "	Non-sect.	1833	1834
Ohio State University	Columbus, "	"	1870	1873
Ohio University	Athens, "	"	1804	1809
Ohio Wesleyan Univ.	Delaware, "	M. E.	1842	1844
Otterbein University	Westerville, "	U. B.	1849	1847
Richmond College	Richmond, "	Non-sect.	1835	1843
Rio Grande "	Rio Grande, "	F.-W. Baptist	1875	1876
St. Joseph's "	Cincinnati, "	R. C.	1873	1871
St. Xavier "	" "	"	1869	1840
Scio "	Scio, "	M. E.	1864	1859
Twin Valley "	Germantown, "	Non-sect.	1887	1886
Urbana University	Urbana, "	New Church	1850	1851
Western Reserve Univ.	Cleveland, "	Non-sect.	1826	1826
Wilberforce University	Wilberforce, "	Afr. M. E.	1856	1856
Willoughby College	Willoughby, "	Methodist	1858	1859
Wilmington "	Wilmington, "	Friends	1875	1870
Wittenberg "	Springfield, "	Ev. Lutheran	1845	1845
Wooster, University of	Wooster, "	Presbyterian	1866	1870
Blue Mountain University	La Grande, Ore.	Non-sect.	1876	1876
Christian College	Monmouth, "	Christian	1865	1866
Corvallis "	Corvallis, "	M. E. So.	1868	1865
McMinnville College	McMinnville, "	Baptist	1859	1860
Oregon, University of	Eugene City, "	Non-sect.	1872	1876
Pacific University	Forest Grove, "	Cong.	1854	1848
Philomath College	Philomath, "	U. B.	1865	1868
Willamette University	Salem, "	M. E.	1853	1844
Allegheny College	Meadville, Pa.	"	1817	1815
Bucknell University	Lewisburgh, "	Baptist	1846	1845
Bryn Mawr College	Bryn Mawr, "	Non-sect.	1880	1885
Central Penn. College	New Berlin, "	Ev. Ass'n	1880	1856
Dickinson College	Carlisle, "	M. E.	1783	1783
Franklin and Marshall College	Lancaster, "	Reformed	1853	1853
Geneva College	Beaver Falls, "	Ref. Presb.	1849	1849
Grove City College	Grove City, "	Non-sect.	1879	1876
Haverford "	Haverford Coll., "	Frieuds	1833	1833
Holy Ghost "	Pittsburg, "	R. C.	1882	1878
Lafayette "	Easton, "	Presbyterian	1826	1832
La Salle "	Philadelphia, "	R. C.	1863	1867
Lebanon Valley College	Annville, "	U. B.	1867	1866
Lehigh University	S. Bethlehem, "	P. E.	1866	1866
Lincoln "	Lincoln Univ., "	Presbyterian	1854	1857
Mercersburgh College	Mercersburgh, "	Reformed	1865	1865
Monongahela "	Jefferson, "	Baptist	1871	1871
Muhlenberg "	Allentown, "	Lutheran	1867	1867
Pennsylvania "	Gettysburg, "	"	1832	1832
Penn. Military Academy.	Chester, "	Non-sect.	1862	1862
Pennsylvania, Univ. of	Philadelphia, "	"	1753	1753

NAME.	Location.	Denomination.	Chartered.	Opened.
St. Francis College	Loretto, Pa.	R. C.	1858	1850
St. Joseph's "	Philadelphia, "	"	1852	1852
St. Vincent's "	Beatty, "	"	1870	1846
Swarthmore "	Swarthmore, "	Friends	1864	1869
Thiel "	Greenville, "	Lutheran	1871	1871
Ursinus "	Collegeville, "	Reformed	1869	1870
Villanova "	Villanova, "	R. C.	1848	1842
Washington and Jefferson College	Washington, "	Presbyterian	1802	1802
Western Univ. of Penn.	Allegheny, "	Non-sect.	1819	1822
Westminster College	NewWilmington, "	U. Presb.	1854	1852
Brown University	Providence, R. I.	Non-sect.	1765	1765
Adger College	Walhalla, S. C.	"	1877	1877
Allen University	Columbia, "	M. E.	1880	1881
Charleston, College of	Charleston, "	Non-sect.	1785	1785
Claflin University	Orangeburgh, "	M. E.	1869	1869
Erskine College	Due West, "	As. Ref. Pres.	1842	1839
Furman University	Greenville, "	Baptist	1850	1851
Newberry College	Newberry, "	Lutheran	1856	1858
Presbyterian Coll. of S. C.	Clinton, "	Presbyterian	....	1879
South Carolina, Univ. of.	Columbia, "	Non-sect.	1801	1805
Wofford College	Spartanburg, "	M. E. So.	1852	1854
Dakota University	Mitchell, S. Dak.	M. E.	....	1885
Dakota, University of	Vermilion, "	——	1883	1883
Pierre University	East Pierre, "	Presbyterian	1883	1883
Sionx Falls University	Sioux Falls, "	——	....	....
Yankton College	Yankton, "	Cong.	1881	1882
Bethel "	McKenzie, Tenn.	Cnmb. Presb.	1850	1847
Burritt "	Spencer, "	Christian	1850	1850
Carson and Newman Coll.	Mossy Cr., "	Baptist	1853	1849
Central Tennessee Coll.	Nashville, "	M. E.	1866	1866
Chattanooga University	Chattanooga, "	"	1886	1886
Christian Brothers' Coll.	Memphis, "	R. C.	1872	1871
Cnmberland University	Lebanon, "	Cumb. Presb.	1842	1842
Fisk University	Nashville, "	Cong.	1867	1866
Grant Memorial Univ.	Athens, "	M. E.	1867	1867
Greenville and Tusculnm College	Tusculum, "	Presbyterian	1794	1794
Hiwassee College	Hiwassee, "	M. E. So.	1850	1849
King College	Bristol, "	Presbyterian	1869	1869
Maryville College	Maryville, "	"	1842	1819
Milligan "	Milligan, "	Christian	1882	1882
Roger Williams Univ.	Nashville, "	Baptist	1883	1864
Southwestern Baptist University	Jackson, "	"	1874	1875
Southwestern Presbyterian University	Clarksville, "	Presbyterian	1870	1879
Tennessee, University of.	Knoxville, "	Non-sect.	1794	1795
University of the South.	Sewanee, "	P. E.	1858	1868
Vanderbilt University	Nashville, "	M. E. So.	1873	1875
Austin College	Sherman, Tex.	So. Presb.	1849	1851
Baylor University	Waco, "	Baptist	1845	1846
Fort Worth University	Fort Worth, "	M. E.	1881	1881
Hope Institute	Italy, "	Christian	1886	1881
Mansfield College	Mansfield, "	Non-sect.	1872	1869
Marvin "	Waxahachie, "	"	1873	1872
St. Mary's University	Galveston, "	R. C.	1856	1854
Salado College	Salado, "	Non-sect.	1860	1860
Southwestern University	Georgetown, "	M. E. So.	1875	1873
Texas, University of	Austin, "	Non-sect.	1881	1881
Trinity University	Tehuacana, "	Cnmb. Presb.	1870	1869
Wiley "	Marshall, "	M. E.	1873	1873
Utah, University of	SaltLakeCity, Utah	Non-sect.	1850	1850
Middlebury College	Middlebury, Vt.	"	1800	1801
Norwich University	Norwich, "	"	....	1819
Vermont, University of	Burlington, "	"	1791	1800
Emory and Henry Coll.	Emory, Va.	M. E. So.	1837	1839
Hampden-Sidney College	Hamp.-Sidney, "	Non-sect.	1783	1776
Randolph-Macon "	Ashland, "	M. E. So.	1830	1832
Richmond College	Richmond, "	Baptist	1840	1832
Roanoke "	Salem, "	Lutheran	1853	1853
Virginia, University of	Charlottesville, "	Non-sect.	1819	1825
Washington and Lee University	Lexington, "	"	1782	1749
William and Mary Coll.	Williamsburg, "	P. E.	1693	1694
Holy Angels' College	Vancouver, Wash.	R. C.	1861	1862
Washington, Univ. of	Seattle, "	Non-sect.	1861	1862
Whitman College	Walla Walla, "	Cong.	1883	1882
Bethany "	Bethany, W. Va.	Christian	1840	1841
Shepherd "	Shepherdstown, "	Non-sect.	1871	1871
West Virginia College	Flemington, "	F.-W. Baptist	1868	1868
West Virginia University	Morgantown, "	Non-sect.	1867	1867
Beloit College	Beloit, Wis.	Cong.	1846	1847
Galesville University	Galesville, "	Presbyterian	1854	1859
Lawrence "	Appleton, "	M. E.	1849	1849
Milton College	Milton, "	7th-D. Bapt.	1867	1867
Northwestern University	Watertown, "	Lutheran	1867	1865
Racine College	Racine, "	P. E.	1852	1853
Ripon "	Ripon, "	Cong.	1855	1854
St. Francis of Sales, Seminary of	St. Francis, "	R. C.	....	1856
Wisconsin, University of.	Madison, "	Non-sect.	1848	1849
Wyoming, University of.	Laramie, Wy.	"	1886	1887

C. K. Adams.

College Fraternities: a class of organizations prevalent among the students of the higher institutions of learning in the U. S. With one exception they are secret in character, though this element is in reality a mere concession to the youthful love of the mysterious. They are composed of lodges called "chapters." A fraternity has only one chapter in any one college.

Nomenclature and Insignia.—The names of many of the fraternities are composed of Greek letters, and they are hence called "Greek letter societies." The chapters also bear Greek names, sometimes in the regular order of the dates of their establishment, sometimes with the name of the State added, and sometimes they are named from the colleges or towns in which they are located. Membership is commonly indicated by badges, which usnally display the name and some of the symbols of the fraternity.

Origin and Development.—The first society bearing a Greek name was the *Phi Beta Kappa*, founded at the College of William and Mary in Virginia in 1776. It was social and secret. In December, 1779, it authorized the establishment of branches at Yale and Harvard, and the next year ceased to exist, on account of the confusion incident to the Revolutionary war. The chapter at Yale was established in 1780 and that at Harvard in 1781, these two chapters afterward uniting to establish branches elsewhere. This society became a literary organization; admitting members from the higher classes only, it gradually grew formal and perfunctory, its ritual and so-called secrets were disclosed, and finally admission to its ranks was based entirely upon grounds of scholarship, and after a time its honored badge became simply a symbol of high collegiate rank. It was revivified in 1881, but still remains an honorary society. In 1825 the first of the men's general fraternities, the *Kappa Alpha*, was formed at Union College. In external features it closely copied *Phi Beta Kappa*; it was secret, it had a Greek name, it confined its membership to upper class men, it named its chapters on the same plan, and its badge was, like that of *Phi Beta Kappa*, a watch-key. This society was opposed by the faculty and students, and was accused, on account of its small membership and the exclusion of outsiders from its meetings, of promoting a college aristocracy. In 1827 two other societies of the same nature, *Sigma Phi* and *Delta Phi*, were founded at Union. In 1831 *Sigma Phi* placed a chapter at Hamilton College, and this resulted in the formation there of a rival society, called *Alpha Delta Phi*, in 1832. So the system spread, the establishment of a chapter at a college leading soon to the organization of a rival society or chapter, until in 1898, the last year for which reliable statistics are obtainable, there were nearly 800 chapters in existence.

Organization and Government.—Previous to 1861 the prevalent system of government among the fraternities was a weak supervision by one chapter, usually called a "grand" chapter, modified by the enactments of infrequent conventions of delegates from the chapters. The chapters were otherwise independent. Since the year 1870, or thereabouts, this has changed into a system composed of a legislative body, or convention of chapter delegates, meeting regularly, its sessions being accompanied by public exercises and a banquet, and an administrative body composed of an executive, usually called a president, and assisted by a board of trustees and several minor officials with limited jurisdiction. The aims of the majority of the chapters are purely social. They all endeavor to secure as members students of social or intellectual prominence, and the contest for such between rival chapters is intense at the beginning of each collegiate year. This "cultivation" of prospective members is usually termed "rushing." The act of admitting a member is termed his "initiation," or he is said to have "swung out." The chapters are gradually becoming householders, and in the older colleges it is common for the members to live together in a house owned or rented by them. Many such houses are handsome and costly. In 1898, 142 such buildings were owned by chapters, and 282 were rented, and the number of both are increasing annually. Members of a chapter are said to be *active* when they are in college attendance, *alumni* when they are not, and *honorary* when they have not been initiated while undergraduates. This last-mentioned class of members is being discontinued by the better fraternities. Membership in two fraternities simultaneously is forbidden except under peculiar circumstances, and if a member leaves one and joins another he is said to be "lifted," a practice which is generally condemned as disloyal and unmanly. The alumni frequently form clubs in the larger cities, and sometimes, as in New York, rent buildings.

Literature.—The fraternities have issued publications in the form of catalogues, histories, song-books, music, and magazines. All but one or two have published catalogues. Previous to 1879 such compilations contained merely lists of the members' names. At that time a great advance was

made, and the catalogues have until recently contained full but condensed biographies of the members, historical sketches of the fraternity and the institutions at which the chapters are located, the geographical distribution of the members, and various statistical tables of interest. This elaborate form of catalogue soon became burdensome, and the more widespread fraternities are now returning to a simpler form, leaving catalogues with minute memorabilia to the enterprise of individual chapters. Psi Upsilon, Sigma Chi, and Beta Theta Pi have also published histories, and Phi Delta Theta, Sigma Alpha Epsilon, and Phi Kappa Psi have works of this class in an advanced state of preparation. Song-books have been generally issued. They do not differ materially from current collections of college songs.

Periodicals.—Aside from purely ephemeral attempts at publishing journals made by Delta Upsilon in 1868 and Theta Delta Chi in 1869, the first fraternity journal was the *Beta Theta Pi*, issued by the fraternity of that name in 1872, and still published regularly. Other journals, with the dates of their establishment, are as follows: The *Palm*, of Alpha Tau Omega, 1880; the *Purple and Gold*, of Chi Psi, 1884; the *D. K. E. Quarterly*, 1883; the *Rainbow*, of Delta Tau Delta, and its predecessor, the *Crescent*, 1887; the *Quarterly*, of Delta Upsilon, 1882; the *Journal*, of Kappa Alpha, 1879; the *Caduceus* of Kappa Sigma, and its predecessor, the *Quarterly*, 1885; the *Scroll*, of Phi Delta Theta, 1876; the *Quarterly*, of Phi Gamma Delta, 1879; the Phi Kappa Psi *Shield*, and its quarterly and monthly predecessors, 1875; the Phi Kappa Sigma *Quarterly*, 1890; the Sigma Alpha Epsilon *Record*, 1880; the Sigma Chi *Quarterly*, 1881; the Sigma Nu *Delta*, 1881; the Theta Delta Chi *Shield*, 1884; and the *Garnet and White* of Alpha Chi Rho, 1900. In addition to this list, Alpha Delta Phi published the *Star and Crescent* from 1880 to 1885; Psi Upsilon, the *Diamond* from 1878 to 1886; Chi Phi, the *Quarterly* from 1884 to 1897; and Zeta Psi the *Monthly* and *Quarterly* from 1884 to 1886. The women's societies have also issued similar journals, the first of which was the *Golden Key*, of Kappa Kappa Gamma, 1882, which since 1886 has been called the *Key*; others are the *Arrow*, of Pi Beta Phi, 1885; the *Anchora*, of Delta Gamma, 1884; the *Quarterlies* of Kappa Alpha Theta and Alpha Phi, 1885 and 1888; the *Trident* of Delta Delta Delta, 1891; the *Lyre* of Alpha Chi Omega, 1897; and the *Eleusis* of Chi Omega, 1900. Nearly all of these journals have been irregular in their publication, or have suspended one or more times. But they are all now in fair condition. At first they were secret, and designed to circulate only among members, but now they generally receive subscriptions from outsiders at the nearly uniform price of $1 per annum. Sigma Chi, Sigma Alpha Epsilon, and Phi Delta Theta issue secret periodicals in addition to their regular journals.

The fraternities may be conveniently grouped into men's general and local fraternities, women's societies, and professional societies. A few details only can be given, and those only in regard to the more prominent in the following list. The name of the fraternity is first given, then the total membership, the place and date of origin, the characteristics of the badge, the colors and flower if any, and the number of inactive and active chapters, with their general location. The statistics are given for the summer of 1898. This is the latest date at which trustworthy figures in regard to most of them are available. Later data in regard to a few, though obtainable, would, if given, prove misleading for purposes of comparison.

Men's General Fraternities.—*Alpha Delta Phi*, 7,933; Hamilton College, 1832; badge, a star and crescent; colors, green and white; inactive chapters, 7, active 23, mostly in the East; owns ten buildings. *Alpha Chi Rho*, 76; Trinity (Conn.), 1895; active chapters, 3. *Alpha Tau Omega*, 4,261; Virginia Military Institute, 1865; a Maltese cross; gold, white, green and blue; inactive chapters 19, active 42; chiefly in the South; three buildings. *Beta Theta Pi*, 10,577; Miami University, 1839; an eight-sided oblong shield; pink and blue; the rose; inactive chapters 19, active 62; widely distributed; ten buildings. *Chi Phi*, 4,048; formed by the union of three societies of the same name, the earliest of which was founded at Princeton in 1854; monogram of the letters; scarlet and blue; inactive chapters 24, active 19; in the East and South; five buildings. *Chi Psi*, 3,718; Union College, 1841; monogram of the letters; purple and gold; inactive chapters 9, active 19; in the South and East; eight buildings. *Delta Kappa Epsilon*, 12,948; Yale, 1844 (called generally D. K. E. and the members "Dekes"); a rhomb; blue, gold, and crimson; inactive chapters 13, active 35; mostly in the East; nine buildings. *Delta Phi*, 2,914; Union, 1827; a Maltese cross; blue and white; inactive chapters 4, active 12; mostly in the Middle States; four buildings. *Delta Psi*, 2,989; Columbia, 1847; St. Anthony's cross; light blue; inactive chapters 11, active 8; in the East and South; seven buildings. *Delta Tau Delta*, 5,670; Bethany College, 1860; a four-sided shield; purple, gold, and white; the pansy; 29 inactive and 38 active chapters. The fraternity owns 2 chapter-houses. *Delta Upsilon* (non-secret), 6,275; formed by a confederation of local societies, the oldest of which was founded at Williams, 1834; a monogram of the letters; blue and gold; inactive chapters 5, active 31; mostly in the East; ten buildings. *Kappa Alpha*, 1,395; Union, 1825; a watch-key; scarlet; inactive chapters 2, active 6; in the East; three buildings. *Kappa Alpha*, 3,855 (called the "Southern Order," and has no connection with the fraternity last mentioned); Washington and Lee, 1865; a shield; cardinal and gold; inactive chapters 10, active 37; wholly in the South; owns five buildings. *Kappa Sigma*, 3,466; University of Virginia, 1867; a crescent and star; gold, blue, and red; the lily-of-the-valley; inactive chapters 16, active 47; mostly in the South; owns one building. *Mu Pi Lambda*, 43; Washington and Lee, 1895; active chapters 4; owns no building. *Phi Delta Theta*, 9,609; Miami University, 1848; a shield; white and blue; the carnation; inactive chapters 23, active 63; widely distributed; six buildings. *Phi Gamma Delta*, 6,330; Jefferson College, 1848; a rhomb; royal purple; inactive chapters 27, active 44; mostly in the West; owns two buildings. *Phi Kappa Psi*, 7,435; Jefferson College, 1852; a shield; inactive chapters 18, active 56; mostly in the West and South; nine buildings. *Phi Kappa Sigma*, 2,153; University of Pennsylvania, 1850; a Maltese cross and skull; black and gold; inactive chapters 19, active 12; mostly in the East and South; two buildings. *Phi Sigma Kappa*, 554; Mass. Agricultural College, 1873; a monogram; 8 active chapters. *Phi Phi Phi*, 74; Austin College, 1894; a book and spear; black, white, and blue; active chapters 4, inactive 1. *Pi Kappa Alpha*, 1061; University of Virginia, 1868; a shield and diamond; garnet and gold; inactive chapters 8, active 11; all in the South; no buildings. *Psi Upsilon*, 8,585; Union, 1833; a rhomb; garnet and gold; inactive chapters 1, active chapters 21; mostly in the East; thirteen buildings. *Sigma Alpha Epsilon*, 5,668; University of Alabama, 1856; a rhomb; purple and gold; inactive chapters 30, active 54; mostly in the South; two buildings. *Sigma Chi*, 6,051; Miami University, 1855; a white cross; blue and gold; inactive chapters 21, active 50; mostly in the South and West; during the war had a non-collegiate chapter in a brigade of the Confederate army; five buildings. *Sigma Nu*, 2,864; Virginia Military Institute, 1869; a five-paneled cross; black, white, and gold; inactive chapters 13, active 39; mostly in the South; one building. *Sigma Phi*, 2,190; Union, 1827; a monogram; blue and white; inactive chapters 2, active 8; in the East; owns seven buildings. *Theta Delta Chi*, 3,411; Union, 1847; a shield; black, white, and blue; inactive chapters 17, active 21; in the East; three buildings. *Zeta Psi*, 4,827; New York University, 1846; a monogram; white; inactive chapters 11, active 20; mostly in the East and two in Canada; seven buildings.

Men's Local Fraternities.—While a few of these show a reasonable degree of permanence, the majority are formed for the purpose of securing a charter from some general fraternity. The more permanent ones are *Delta Psi*, University of Vermont, 1863; *I. K. A.*, Trinity, 1829; *Kappa Kappa Kappa*, Dartmouth, 1842; *Lambda Iota*, University of Vermont, 1836; and *Phi Nu Theta*, Wesleyan, 1837.

Women's Societies.—*Alpha Phi*, 832; Syracuse University, 1872; monogram badge; 9 chapters; owns one building. *Chi Omega*, 136 (estimated); Arkansas University, 1895; monogram badge; 9 chapters. *Delta Delta Delta*, 643; Boston University, 1888; crescent badge; 15 chapters. *Delta Gamma*, 1,205; University of Mississippi, 1872; anchor badge; 13 active 10 inactive chapters. *Gamma Phi Beta*, 633; Syracuse University, 1874; monogram badge; 8 chapters. *Kappa Alpha Theta*, 2,339; De Pauw University, 1870; kite-shaped badge; 23 chapters. *Kappa Kappa Gamma*, 2,937; Monmouth College, 1870; badge, a golden key; 27 chapters. *Pi Beta Phi*, 3,119; Monmouth College, 1867; badge, an arrow; 27 chapters.

Professional Societies.—There are *Alpha Chi Omega*, musical; *Alpha Epsilon Iota*, *Alpha Kappa Kappa*, *Alpha*

Mu Pi Omega, *Alpha Upsilon Mu*, *Delta Epsilon Iota*, *Mu Sigma Alpha*, *Nu Sigma Nu*, *Omega Psi*, *Omega Upsilon Phi*, *Phi Alpha Gamma*, *Phi Chi*, *Phi Sigma Psi*, *Pi Mu*, and *Phi Rho Sigma*, medical; *Beta Phi Sigma*, and *Phi Chi*, pharmacal; *Delta Chi* and *Phi Delta Phi*, legal; *Delta Sigma Delta*, dental; and *D. G. K.* and *Theta Xi*, scientific. *Phi Delta Phi*, *Nu Sigma Nu*, *Phi Rho Sigma*, and *Delta Sigma Detta* publish creditable and more or less professional periodicals.

WILLIAM RAIMOND BAIRD.

College of New Jersey: See PRINCETON UNIVERSITY, in the Appendix.

College Point: formerly a village; now a part of the borough of Queens, New York city; on the Long Island R. R. and on East river; has manufactures of hard rubber and silk ribbon. Pop. (1880) 4,192; (1890) 6,127.

Collegeville: village; Montgomery co., Pa. (for location of county, see map of Pennsylvania, ref. 6–I); on Perkiomen R. R. Here are Ursinus College (Reformed German), Pennsylvania Female College, and two popular summer resorts (Glenwood Hall and Prospect Terrace), and machine-works. The chief industry is agriculture. Pop. (1900) 611.

EDITOR OF "INDEPENDENT."

Collegiants: a sect of Christians in Holland; so called from their assemblies, which they called "colleges." The original members were Remonstrant (Arminian) laity, and the leaders were three brothers, John, Adrian, and Gilbert van der Kodde, of Warmond. The sect arose about 1620, transferred its headquarters after a little to Rhynsburg, near Leyden, hence they were called popularly *Rhynsburgers*; after 1625 it spread all over the country, but died with the century. They rejected all creeds, had no regular ministry, but claimed that their preachers spoke under the guidance of the Spirit. They forbade military service and public office to their members, and had no form of church government. They practiced immersion as the only baptism, and open communion.

Collegiate Education of Women: until about the middle of the nineteenth century it was held by a majority of mankind that although collegiate education might be good for men it was not good for women. Accordingly, institutions for the higher education of women were few in number and inadequately equipped and endowed. For many years the seminary at Mt. Holyoke, Mass., was regarded in the North as the foremost institution for the education of women in the U. S. With advancing thought in regard to the position of women, however, public opinion was gradually modified in regard to the facilities that should be provided for woman's education. This changing public opinion assumed two distinct forms. One class of people held that young women should not be educated with young men, but should receive their higher training in colleges designed for young women alone; while another class held that the most desirable results are likely to be obtained when young men and young women are educated in the same institution, and, for the most part at least, in the same classes. These two forms of belief soon made two classes of colleges available to women. Elmira College, chartered as "Elmira Female College" in 1855, was the first of the colleges designed and generously equipped for the exclusive use of women; and Oberlin College, in Ohio, founded in 1834 "for both sexes and all colors," was the first of the larger colleges to offer its advantages to men and women alike. Wellesley College, at Wellesley, Mass., was opened in 1875; Smith College, at Northampton, Mass., in 1875; and Bryn Mawr College, at Bryn Mawr, Pa., in 1885. These institutions all arose at once to a flourishing condition, and, as will be seen by the figures given below, have come to be numerously attended. The courses of study for undergraduates in all these colleges are substantially equivalent to the courses offered in the colleges designed for young men. Bryn Mawr is entitled to the distinction of having organized the work with special reference to the needs of graduate students, and the number of graduate students in attendance shows that efforts in this direction have been appreciated. In all of the colleges just named the young women in attendance live, for the most part or wholly, in buildings provided by the college corporation, and are constantly under the more or less rigid supervision of the college authorities. At Smith College the policy of cottage life is predominant; at Bryn Mawr a medium course is pursued; while at Wellesley and Vassar the young women live in large and elegantly appointed buildings, which provide lodging-rooms as well as lecture-halls, libraries, and museums. At Wellesley the resident teaching corps is made up exclusively of women; at Vassar, Smith, and Bryn Mawr the teaching force is partly of men and partly of women. In all these colleges lectures by non-resident scholars of distinction are frequently provided. The degrees conferred are the same as at colleges for young men.

While the colleges just named have been offering their advantages to young women in the Eastern part of the U. S., opportunities of another nature have been opened in the Middle and Western States. The University of Iowa opened its doors to women on equal terms with men in 1860, and the example thus set was rapidly followed by Michigan and the other State universities. The colleges founded on a denominational basis have so generally imitated the same example that what is called coeducation may be regarded as the prevalent method in institutions W. of the Alleghanies. While none of the older and larger colleges and universities of New England and the South have opened their doors to women, none of the more prominent institutions of the Middle and Northwestern States have been organized for men alone. The Leland Stanford Junior University, which was opened in 1891 with a richer endowment than that of any other educational institution in the U. S., offers its advantages to women as well as to men. The same is true of the University of Chicago, which was opened in 1892. While the schools of law, medicine, and theology have, at least in the Western States, been more or less generally accessible to women, the number of women in the professional schools has not been large, excepting in the schools of medicine. Since 1869 the department of medicine and surgery in the University of Michigan has offered its instruction to women, and large numbers have availed themselves of the advantages offered. To a majority of the medical schools of the country, however, women have not been admitted.

It would be a mistake to suppose that the collegiate education of women has advanced without serious opposition. During the years between 1860 and 1880 much was written on the subject. While few of the writers ventured to question the propriety of affording women opportunities for higher education, yet whenever such opportunities assumed a concrete form there was aroused a more or less active opposition. In general, however, the objections to colleges for women alone were far less numerous than the objections to colleges for men and women in the same classes. Although the opposition assumed a variety of phases, it made its impression chiefly by means of three different assertions. The first was that the health of young women was not so firm and so steady as to enable them to pursue a collegiate course with advantage. This argument was pressed with special force in opposition to the education of young women in institutions where their progress and proficiency would be constantly compared with those of the young men. Some of the highest medical authorities asserted that the result of such coeducation would be disastrous. A second objection often urged was that the mental capacities and aptitudes of young women are not such as to enable them advantageously to carry on collegiate work in the same classes as young men. It was urged either that the young women would be obliged to work so hard as to endanger their health, or that the young men would have to be held back in order to accommodate the slower pace of their weaker classmates. A third objection urged was that young men and young women of collegiate age can not be brought into the social relations ordinarily, if not necessarily, involved in coeducation without such distractions from study as will interfere with their educational progress. To the first two of these objections experience has given a positive answer. Not only is the attendance upon college duties quite as regular on the part of young women as on the part of young men, but the general health of young women has been adequate to the demands made upon it. Where opportunities for gymnastic training and exercise are as generously provided for young women as for young men, it has been found that the average health and strength of the young women is higher at the time of graduation than it was at the time of entering college. In the matter of scholarship, moreover, experience is no less decided. While it is true that to certain phases of certain studies the feminine mind is not quite so well adapted as the masculine mind, still it is probably correct to say that, taking all studies as a whole, the attainments of the young women, as shown in regular class-work and in examinations, are slightly higher

than the attainments of the young men. This result appears to have been unmistakably shown by statistics prepared at the University of Michigan, at Cornell University, and at the University of Wisconsin. While this fact should not be regarded as proving too much, it does at least show that under ordinary circumstances young women are capable of collegiate proficiency that will compare favorably with that of young men in the same classes. But in regard to the third objection experience has not given so unambiguous an answer. It is certain that social distractions from study are often very considerable, and it is probable that college officers of much experience with coeducation would generally admit that objections to the system on this ground are the only ones that any longer can be urged with any appearance of reason. And on this point all that can be said is included in the statement that until a young woman is so mature and serious in her purpose as to discriminate wisely between her studies and her social recreations, she is not in a position to profit in a coeducational institution.

While the higher education of women has been making rapid progress in the U. S., similar advances have been made in some of the countries of Europe. At Oxford and Cambridge women have not yet been admitted to academic degrees; but at both of those venerable institutions colleges for women have been founded, and instruction is given by teachers of the highest rank. At Paris and at a few of the universities of Germany women are admitted to lectures, though they are not yet entitled to examinations for degrees. Of the few European institutions in which the higher degrees are given to women on the same conditions as to men, the University of Zurich in Switzerland is the best known.

The following tables, made up from official reports, show the number of women pursuing either graduate studies or a collegiate course of four years in the larger colleges to which women are admitted in the U. S. The figures, unless otherwise indicated, are for the years 1898–99:

I. COLLEGES IN THE U. S. EXCLUSIVELY FOR WOMEN.

NAME OF COLLEGE.	Graduates.	Undergraduates.
Wellesley College, Wellesley, Mass.	26	633
Mt. Holyoke College, Mt. Holyoke, Mass.	3	438
Smith College, Northampton, Mass.	4	1,070
Vassar College, Poughkeepsie, N. Y.	11	614
Bryn Mawr College, Bryn Mawr, Pa.	67	287
Totals	111	3,042

II. COLLEGES OPEN TO MEN AND WOMEN ON THE SAME CONDITIONS.

NAME OF COLLEGE.	GRADUATES.		UNDER-GRADUATES.	
	Men.	Women.	Men.	Women.
University of California	99	89	853	679
Leland Stanford Junior University	51	43	639	420
University of Colorado	18	7	173	103
State Agricultural Coll., Colorado	3	4	95	98
University of Denver	..	..	45	39
Columbian Coll., Washington, D. C.	57	13	241	105
Wesleyan University, Connecticut	5	2	251	73
Northwestern University, Illinois	24	14	281	256
Lake Forest University, Illinois	4	1	69	45
De Pauw University, Indiana	8	4	217	108
University of Indiana	63	14	582	302
" " Kansas	32	10	427	243
Drake University, Des Moines, Ia.	4	2	95	44
Iowa College (1890–91)	2	1	142	119
Boston University	72	30	121	297
University of Michigan	53	18	880	575
" " Minnesota	147	48	646	495
" " Mississippi	4	..	131	29
" " Missouri	22	6	486	167
" " Nebraska (1890–91)	40	28	529	446
" " Iowa (1890–91)	27	21	425	193
Cornell University	149	41	1,208	249
Oberlin College	2	4	179	240
Ohio Wesleyan University	4	4	293	238
University of South Dakota	1	2	40	42
Swarthmore College, Pennsylvania	..	..	74	114
Dickinson College, Pennsylvania	..	..	208	31
Yankton College, South Dakota	..	..	27	16
Washington State University	8	2	110	102
University of Vermont	3	1	229	63
" " Texas	10	10	287	165
" " Wyoming	2	1	33	23
Ohio University	29	12	715	177
Western Reserve University, Ohio	13	12	182	183
University of Cincinnati, Ohio	28	23	170	184
University of Wisconsin	67	28	1,102	364
Totals	1,051	495	12,185	7,027

C. K. ADAMS.

Collem'bola [from Gr. κόλλα, glue + ἔμβολον, peg, wedge]: a sub-order of insects, so called in allusion to a sucker-like organ at the base of the abdomen. See THYSANURA.

Colleton, JAMES: colonial Governor of South Carolina. He was a brother of one of the proprietaries, and in 1686 was appointed Governor in the interest of the proprietaries, with the rank of landgrave; endeavored to enforce the laws in the constitutions which the colonists refused to recognize as binding upon them. He met with bitter opposition from the majority of the colonial Parliament, and excluded them from their seats. In 1687 a new Parliament was elected, and the assembly resorted to open defiance, and in 1690 he was impeached, disfranchised, and banished from the province. Revised by F. STURGES ALLEN.

Collett, JACOBINE CAMILLA: Norwegian novelist and woman of letters; sister of Wergeland; b. Jan. 23, 1813. Of her works may be mentioned *Amtmandens Døttre* (The Magistrate's Daughters, 1885), the first and perhaps the best of her novels; *Fortællinger* (Tales, 1861); *I de lange Nætter* (In the Long Nights, 1863), *Mod Strømmen* (Against the Stream, 1879; 2d series 1885); *Sidste Blade, Erindringer og Bekjendelser* (Last Leaves, Recollections and Confessions, 1868, 1872, 1873). The emancipation of woman was, in one way or another, the underlying purpose of most of this author's literary work. D. in Christiania, Mar. 7, 1895. G. L. KITTREDGE.

Collet'ta, PIETRO: an Italian historian and general; b. at Naples, Jan. 23, 1775. He was a general in the army of Murat (1812–14), and was Minister of War at Naples in 1820; exiled in 1821; wrote a *History of the Kingdom of Naples from 1734 to 1825* (1834). D. Nov. 11, 1833.

Collidine: an alkaloid ($C_8H_{11}N$), found with many others in the products of the destructive distillation of bones and other animal substances, of coal, of quinine, and of cinchonine. It is a colorless oily liquid, having an aromatic odor.

Collier, JEREMY: an English non-juring bishop; b. at Stow Qui (or Quire), in Cambridgeshire, Sept. 23, 1650. He graduated at Cambridge in 1676, was ordained a priest in 1677, and bishop among the non-jurors 1713. He was a zealous Jacobite, and wrote several works against the Government of William III. In 1696 he gave absolution to Friend and Parkyns, who were condemned to death for treason. A sentence of outlawry was passed against him, and never revoked, but he was allowed to live as usual. His chief works are a *Short View of the Profaneness and Immorality of the English Stage* (1698), which caused a great commotion; *Essays on Several Moral Subjects* (3 vols., 1697–1705); and *An Ecclesiastical History of Great Britain . . . to the End of the Reign of Charles II.* (1708–14, 2 vols., fol.; n. ed. with life by T. Lathbury, 1852, 9 vols.) The *Short View* provoked replies from Congreve, Vanbrugh, and Dr. Filmer, but finally the playwrights were worsted, and the bellicose tract of the sturdy moralist shamed the English stage out of its grossness. D. in London, Apr. 26, 1726.

Collier, JOHN: portrait and figure painter; b. in England; contemporary. He has painted portraits of many well-known Englishmen; Legion of Honor 1878. His work is serious and good in color. Studio in London. W. A. C.

Collier, JOHN PAYNE: b. in London, Jan. 11, 1789; died there Sept. 18, 1883. One of his earliest works was *The Poetical Decameron* (1820), followed in 1825 by his edition of *Dodsley's Old Plays*, and in 1831 by his *History of Dramatic Poetry*. Gradually he approached the central figure of the whole period, and in 1835 he published *New Facts Regarding the Life of Shakspeare*; in 1836, *New Particulars*; in 1839, *Further Particulars*; and in 1842–44, his *Life of Shakspeare*, which in 1846 he followed up by his *Memoirs of the Principal Actors in the Plays of Shakspeare*.

Collieries: See MINES and MINING.

Collima'tion, Line of [*collimation* is from the spurious Lat. word *collima're*, due to an erroneous reading for *collinea're*, bring together into a straight line; *con*, together + *li'nea*, line]: in astronomy, the central axis of a telescope, or the line passing through the center of the object-glass and the center of the eye-piece when the latter is in some standard position. In the case of the transit instrument, the line of collimation is defined as that which

passes through the optical center at right angles to the axis on which the instrument turns. In the case of a telescope furnished with a revolving micrometer and position circle, the line of collimation is that which passes through the center of the object-glass and the center of revolution of the micrometer. S. N.

Col'limator: a fixed telescope, used to adjust another telescope. It was the invention of DAVID RITTENHOUSE (*q. v.*), of Philadelphia, an eminent astronomer of the eighteenth century, but its advantages were first made widely known by Bessel. It consists of a small telescope, with spider lines stretched across its focus in the usual way. If this telescope be now set in a fixed position, and another telescope be pointed so as to look through its object-glass, the observer at the second telescope will see the spider lines in the collimator as if they were at an infinite distance from him. Thus when a collimator is firmly fixed it may be used as a line of sight, the threads in the focus representing infinitely distant lines on which another telescope may be sighted. The peculiar feature of the collimator is that it is not mainly used to look through, but that light is sent through it in the reverse of the usual direction, so that rays emanating from a point in its focus are parallel after they emerge from the objective. S. N.

Collin, kŏl'lăn', LOUIS JOSEPH RAPHAEL: figure and portrait painter; b. in Paris; contemporary; pupil of Cabanel; second-class medal, Paris Salon 1873; medal of honor, Paris Exposition 1889; Legion of Honor 1884. His *Idyl*, a composition of two nude figures, a youth and a young girl in the open air, is a beautiful work showing fine drawing and subtile modeling. His portraits are refined in character and admirably painted. Studio in Paris.

WILLIAM A. COFFIN.

Collin d'Harleville, -dăarl'veel', JEAN FRANÇOIS: a French dramatist and poet of much merit whose works still survive on the stage; b. May 30, 1755. His first work was a comedy, *l'Inconstant*, performed at the Théâtre Français in 1786. This was followed by *l'Optimiste* (1788); *M. de Crac dans son petit castel* (1791); *Le Vieux Célibataire* (his masterpiece, 1793); *Châteaux en Espagne* (1803). These all show the poet a writer of the school of Regnard, witty, gay, master of a pointed and clever, though somewhat superficial, style. His dramatic works form four vols. in 8vo (best ed. 1822, with notice of the author by Andrieux). D. Feb. 24, 1806. Revised by A. R. MARSH.

Col'lingwood: a port of Lake Huron, on the south shore of Georgian Bay, in Nottawasaga township, Simcoe co., Ontario, Canada; on the Breton and Collingwood and the Medford Branches of Gr. Tr. Ry, 94 miles N. by W. of Toronto (see map of Ontario, ref. 3–D). It has large manufactures of lumber, leather, flour, beer, etc.; has good schools and a large trade. It has regular lines of steamers to various lake-ports. Pop. 4,940.

Collingwood: a northeastern suburb of Melbourne, Victoria, Australia. Pop. (1888) estimated, 32,334.

Collingwood, CUTHBERT, Lord: an English admiral; b. in Newcastle-upon-Tyne, Sept. 26, 1750; entered the navy in 1761. He was an intimate friend of Lord Nelson, and was distinguished as a naval tactician; followed Admiral Graves to America (1774), and was made lieutenant after the battle of Bunker Hill (1775). In 1780 he became a post-captain. He took part in the naval victory which Lord Howe gained over the French in June, 1794, and rendered important services at the battle off Cape St. Vincent in Feb., 1797. In 1799 he gained the rank of rear-admiral; in 1804 that of admiral. He was the second in command at the battle of Trafalgar, Oct., 1805, and the chief command devolved on him before the end of the action in consequence of the death of Nelson. For his part in this victory he was raised to the peerage. D. at sea near Minorca, Mar. 7, 1810.

Collingwood, FRANCIS: civil engineer; b. at Elmira, N. Y., Jan. 10, 1834; was graduated from the Rensselaer Polytechnic Institute in 1855. He has been actively engaged in the work of his profession, and has held the positions of city engineer of Elmira, assistant engineer of the East river suspension bridge, chief engineer of Newport News dry-dock, and since Jan. 1, 1891, secretary of the American Society of Civil Engineers. He is the author of a number of valuable papers published in the *Transactions* of the American Society of Civil Engineers and in other technical journals. For his paper on repairs to the Allegheny suspension bridge he was awarded the Telford premium and the Telford medal by the Institution of Civil Engineers of Great Britain. He is a member of several engineering societies of this country and Europe, a fellow of the American Association for the Advancement of Science, a member of the New York Microscopical Society, and of the New York Academy of Science.

Collins, ANTHONY: an able and liberal English writer on theology; b. either at Isleworth or at Heston, near Hounslow, in Middlesex, June 21, 1676; educated at Cambridge. He was an intimate friend of John Locke, and was a subtle disputant. Among his works, which excited much commotion and were censured by the clergy, are *Priestcraft in Perfection* (London, 1709); *Vindication of the Divine Attributes* (1710); *Discourses on Free Thinking* (1713); and *Discourse on the Grounds and Reasons of the Christian Religion* (1724). D. Dec. 13, 1729. See Cairns, *Unbelief in the Eighteenth Century*, Edinburgh (1881).

Collins, PATRICK ANDREW: lawyer and politician; b. in Fermoy, Ireland, Mar. 12, 1844; in 1848 settled in Chelsea, Mass.; was for eight years an upholsterer; studied law in the Harvard Law School and in Boston, where he has practiced since his admission to the bar in 1871. He was member of the Massachusetts House of Representatives 1868–69; State senator 1870–71; judge advocate-general in 1875; delegate-at-large to the Democratic national conventions of 1876 and 1880; member of U. S. House of Representatives 1883–89. He was chosen president of the Land League at the convention in Buffalo, N. Y., in 1884. In 1893 he was appointed by President Cleveland U. S. consul at London.

Collins, WILLIAM: English lyric poet; b. at Chichester, Dec. 25, 1721; educated at Oxford. He became a resident of London in 1744, and was a friend of Dr. Johnson. He produced in 1747 an admirable ode on *The Passions*, and lyric poems, among which are odes to Mercy and Evening. He was subject to melancholy, and was confined in an asylum in the latter part of his life. D. June 12, 1759. Among his works is the *Dirge in Cymbeline*. See Johnson, *Lives of the Poets*.

Collins, WILLIAM: landscape and genre painter; b. in London, Sept. 18, 1788; d. there Feb. 17, 1847. Pupil of Royal Academy; traveled and studied on the Continent, especially in Italy, 1836–38. His pictures are feeble in color and drawing, but were popular on account of their subjects, which showed scenes of rustic life. Royal Academician 1810. W. A. C.

Collins, WILLIAM WILKIE: novelist; b. in London in 1824. He was first articled to a tea-merchant; then entered Lincoln's Inn. His tastes, however, were decidedly literary, and in 1848 he published an excellent biography of his father, with selections from his journals and correspondence, in two volumes. After this success he devoted himself exclusively to literature and published a number of novels, which, though sometimes of a rather questionable taste, became very popular, and were translated into both French and German. The most remarkable among his novels are *Antonina* (2d ed. 1850); *Basil* (1852); *The Dead Secret* (1857); *Woman in White* (1859–60); *Armadale* (1866); *Man and Wife* (1870); *No Name*, *The Moonstone*, *Poor Miss Finch* (1872); *The New Magdalen* (1873); *Two Destinies* (1876); *The Haunted Hotel* (1878); *The Fallen Leaves* (1879); *Heart and Science* (1883), etc. His drama *The Lighthouse* was first played in private at Tavistock House, and afterward produced with great success at the Olympic theater, London. The same was the case with another drama of his, *The Frozen Deep*. D. Sept. 23, 1889.

Collinsville: village; in Canton township, Hartford co., Conn.; on the Farmington river, and the New England, and the N. Y., New Haven and Hartford railways (for location, see map of Connecticut, ref. 8–F); has four churches, good schools, a large ax-factory, and manufactures of cutlery, etc. Pop. (1880) 1,376; township (1890) 2,500: (1900) 2,678.

Collinsville: city; Madison co., Ill. (for location of county, see map of Illinois, ref. 8–D); on Vandalia R. R.; 11 miles E. by N. of St. Louis. Pop. (1880) 2,887; (1890) 3,498: (1900) 4,021.

Collision: in maritime law. See ROAD, LAW OF THE.

Collision [from Lat. *colli'sio*, deriv. of *colli'dere*; *con*, together + *lae'dere*, injure by striking]: in mechanics, the impact of two bodies, one or both of which were previously in motion. The laws of the direct impact of two spherical bodies are deduced from the principle that the sum of the momenta of the impinging bodies, estimated in a fixed di-

rection along the line of motion, is not altered by the collision. The velocities of the bodies after impact, however, depend upon the hardness and elasticity of these bodies. If inelastic and completely incompressible, they will move after impact as one body, with a velocity and in a direction which is ascertained by dividing the algebraical sum of their previous momenta by that of their masses. If compressible and not wholly without elasticity, a certain compression takes place on collision, and is immediately followed by a more or less perfect restitution of form, according to the degrees of elasticity which the bodies possess. In this case the bodies will *not* move as one body after collision, but the impinging body will move more slowly than the other, and may even have the direction of its motion reversed.

Col'litz, Hermann, Ph. D.: philologist; b. at Bleckede, Germany, Feb. 4, 1855; educated in Lüneburg Gymnasium 1869–75; Göttingen and Berlin 1875–82; assistant librarian, Halle, 1883; lecturer in the university of Halle 1885; and Professor of Comparative Philology at Bryn Mawr College 1886; author of *Die Flexion der Nomina mit dreifacher Abstüfung im Allind. und Griech.* (1885); *Die Verwandtschaftsverhällnisse der Griech. Dialekte* (1885); *Die Neuesle Sprachforschung und die Erklärung der indogerm. Ablaules* (1886); *Sammlung der griechischen Dialektinschriften*; and numerous essays and reviews both in German and English. C. H. Thurber.

Collo'dion or **Collodium** [from Gr. κολλώδης, glue-like, viscous; κόλλα, glue + εἶδος, appearance]: a clear, colorless, gummy liquid, insoluble in water or alcohol, but soluble in ether, consisting of pyroxylin or guncotton dissolved in a mixture of alcohol and ether. When dried, it gives a transparent residue, becoming electric by friction, and exploding less readily by heat, percussion, etc., than ordinary guncotton. It is used principally in photography, though it also finds application in surgery and medicine for covering wounds to exclude the air, coating caustic substances, etc. Small quantities of guncotton for the preparation of collodion are made by immersing cleaned cotton in a solution formed by dissolving nitrate of potassium in concentrated sulphuric acids. Larger quantities are made by treating cotton with a mixture of concentrated commercial sulphuric and nitric acids. Some water is added, in order to cause the formation of the lower nitro-compounds of cellulose; but if too much water is added, the cotton dissolves, instead of forming the desired compound. The operation is conducted at a temperature of about 150° F., and great care and judgment are required throughout the process. After treatment the cotton is washed with cold water, the use of alkalies for neutralizing the excess of acid having a bad effect on the quality of the collodion if it is to be used for photography. The best guncotton for this purpose shows an increase of 25 per cent. in weight over that of the cotton originally employed. In making the solution of the guncotton, if too much alcohol is employed the sensitiveness of the film and its capacity for adhering to glass are impaired; if too little, the film is apt to contract after sensitizing. Photographers make use of two kinds of collodion—the "plain" and the "iodized," the latter being the plain collodion which has received the addition of some iodides or bromides, generally the iodides of cadmium and ammonium. Plain collodion is often of two kinds—"positive" and "negative"—the pyroxylin for these being prepared according to a slightly different formula. For the "positive collodion" less water is used in the preparation of the pyroxylin.

Small balloons, lighter than those made from gold-beater's skin, are sometimes made with collodion. The liquid is poured into a flask and shaken about until the interior is completely covered; the ether and alcohol are then evaporated off by a blast directed into the flask. By drawing the air out of the flask by means of a tube suitably adjusted, the film is detached, the balloon collapses, and may be drawn out. It is then distended and dried.

Collop-Monday: the Monday after Quinquagesima Sunday; so called because on that day the faithful began to abstain from the use of flesh meat or collops.

Collot-d'Herbois, kōl'lō'dăr'bwăă', Jean Marie: French Jacobin; b. in Paris in 1750; originally a strolling player; was a member of the convention, and a partisan of Robespierre, notorious for his violence and cruelty. He became a member of the committee of public safety in 1793, and was sent to Lyons, where he caused hundreds to be put to death. In the crisis of the 9th Thermidor, 1794, he acted with the enemies of Robespierre. In 1795 he was transported to Cayenne, where he died Jan. 8, 1796.

Collu'thus: Greek epic poet of Lycopolis in the Thebaid; lived in the time of the Emperor Anastasius (491–518). One poem, *The Rape of Helen* (Ἁρπαγὴ Ἑλένης), 385 verses, has been preserved. Ed. with commentary by Lennep (1247); repeated by Schäfer (1825); text ed. by Lehrs (1841) in the Didot collection, and by Abel (1880).

Coll'yer, Robert, D. D.: Unitarian divine and a popular lecturer; b. in Keighley, England, Dec. 8, 1823. In 1847 he removed to the U. S., and became a Methodist lay preacher. Three years later he embraced Unitarian views, and, abandoning his mechanic's trade, entered the ministry. He was pastor of Unity church, Chicago, from 1859 to 1879, when he became pastor of the Church of the Messiah in New York city, where he still remains. Besides many sermons and addresses, he has published the following books: *Nature and Life* (sermons; Boston, 1867); *A Man in Earnest* (1868); *The Life that Now Is* (sermons; 1871); *The Simple Truth* (1877); *Talks to Young Men* (1887).

Colman, kōl'man, Benjamin, D. D.: Congregational divine; b. in Boston, Mass., Oct. 19, 1673; graduated at Harvard in 1692. On a passage to England he was taken prisoner by a French vessel in 1695, but finally visited England, and returned to the U. S. in 1699. He became pastor of the Brattle Street church, Boston (at that time an independent church), with which he was connected till his death. D. in Boston, Aug. 29, 1747. He was distinguished for his eloquence in the pulpit. See his biography by Rev. Ebenezer Turell, Boston, 1749. Revised by George P. Fisher.

Colman, George: English dramatic author; b. in Florence, Apr. 28, 1733. He produced in 1760 *Polly Honeycomb*, and in 1761 the *Jealous Wife*, comedies, and a good metrical translation of Terence (1764). In 1777 he became the proprietor of the Haymarket theater, London. He wrote and adapted several other dramas. D. Aug. 14, 1794.—His son, George Colman, b. Oct. 21, 1762, became director of the Haymarket theater in 1785, and wrote numerous successful comedies and farces, among which are *John Bull* (1805); *Inkle and Yarico*; and *The Heir-at-law*. He published autobiographic memoirs, entitled *Random Recollections* (2 vols., 1830). D. Oct. 26, 1836.

Colman, Samuel: landscape-painter; b. in Portland, Me., 1832. Pupil of A. B. Durand, New York; National Academician 1862; has traveled extensively abroad, and painted pictures in Italy, Spain, France, North Africa, etc. He is proficient in the use of water-colors, and frequently paints in that medium. He was one of the founders of the American Water-color Society, and its first president (1866–71). His work is notable for attractive color schemes. Studio at Newport, R. I. William A. Coffin.

Col'mar, or **Kolmar** (Lat. *Columbarium*): a city of Alsace; finely situated on the river Lauch; near the base of the Vosges, 41 miles S. S. W. of Strassburg (see map of German Empire, ref. 7-C). It is well built, and contains a cathedral built in 1363, a theater, and a college with a library of 60,000 volumes. The old ramparts have been converted into boulevards. Colmar has extensive manufactures of cotton fabrics, cutlery, paper, hosiery, and ribbons. It grew up around a royal residence called "Columbaria" (the "dovecot"), first mentioned in the eighth century. It obtained a charter of incorporation in 1226, was made a free imperial city by Frederick II., and was ceded to France in 1697. Pop. (1880) 26,106; (1890) 30,411.

Colne, kōln: a market-town of Lancashire, England; on an affluent of the Calder; 26 miles N. of Manchester by railway (see map of England, ref. 6-G). It has manufactures of calicoes, and mousseline-de-laine. Slate and limestone are quarried in the neighborhood. Among notable buildings are the Church of St. Bartholomew and the cloth-hall. Pop. of Colne and Marsden (1891) 16,774.

Col'obus [from Gr. κολοβός, docked; in allusion to the usual absence of the thumb]: a genus of long-tailed, slender-limbed African monkeys, having the thumb rudimentary or absent. There are about a dozen species, some very brightly colored, among them the Guereza monkey, whose fur has of late years been in much demand. F. A. Lucas.

Colocasia: See Cocco-root.

Colocynth [from Gr. κολοκυνθίς]: the fruit of *Citrullus colocynthis*, a plant with a perennial root and hairy, many-lobed leaves. It is said to be indigenous to Japan, but is

found very largely throughout Western Asia and Greece and in the neighborhood of the Cape of Good Hope. It is also cultivated in Spain. The colocynth fruit is prepared for use in medicine by triturating five parts of colocynth pulp and one part of powdered gum acacia with sufficient water to form a paste, which is then dried and pulverized. Chemical analysis shows that it contains a bitter principle called colocynthin and a crystallized principle which has been called colocynthitin. When taken internally colocynth acts as a powerful purgative, producing large watery movements. For this reason it is used to unload the bowels in cases of obstinate constipation, and also for the purpose of removing dropsical effusions. Because of its powerful purgative properties it has also been used as a vermifuge. It has also been used in cases of melancholia depending upon hepatic torpor, and some physicians think it possesses the property of stimulating the kidneys. H. A. H.

Cologne [in Germ. *Köln*; anc. *Oppidum Ubiorum*, afterward *Colonia Agrippina*]: a fortified city of Prussia; the capital of the province of Rhenish Prussia; on the left bank of the Rhine, 24 miles S. E. of Düsseldorf; lat. 50° 56′ N., lon. 6° 58′ E. (see map of German Empire, ref. 5–C). It is at the intersection of several important railways, and is connected with Deutz by a handsome iron bridge across the river and by a bridge of boats. Cologne is a fortress of the first rank. It is built in semicircular form close to the river. The streets are narrow. Outside the walls are fine gardens and promenades. Among the public buildings are: archbishop's palace, observatory, botanic and zoölogical gardens, public library, museum, theater, arsenal (with a curious collection of armor), seminary for the education of Catholic clergymen, three gymnasia, pro-gymnasium, normal school, and a fine city-hall. Cologne is noted for its churches, chief of which is the world-renowned cathedral, the largest specimen of Gothic architecture in the world. The cathedral was begun by Gerhard under Archbishop Konrad, of Hochstaden, in 1248. The work progressed slowly through centuries, being retarded by the Reformation. Early in the nineteenth century the Germans, moved by national enthusiasm, raised large sums of money for the repair and completion of the work, at first under the direction of Ahlert and then of Zwirner. The completion of the cathedral in 1880 was an event of world-wide interest. The structure is in the form of a cross, 510 feet long and 231 feet wide, with twin towers in front attaining the height of 525 feet. Other interesting churches are the St. Gereon's, the oldest in the city; St. Severin's, rich in old German paintings; St. Mary's, Church of the Apostles, St. Kunibert's, and St. Ursula's, the latter containing the bones of 11,000 virgins massacred by the Huns. Cologne has large manufactures of silk and woolen fabrics, cotton yarn, velvet, hosiery, lace, hats, thread, clocks, and *eau de cologne*. About 1,500,000 bottles of this perfume are annually exported from this town. It derives also much prosperity from the navigation of the Rhine, and has an active trade in grain, wine, oil, etc. Cologne originated from the Roman colony planted on that spot by Claudius in 51 A. D., and called, in honor of his wife, *Colonia Agrippina*. It was annexed to the German empire in 870 A. D., and was afterward one of the most populous and wealthy cities of the Hanseatic league. The archbishops of Cologne were princes and electors of the German empire during several centuries. Pop. (1900) 372,229. For an illustration of the cathedral see ARCHITECTURE.

Revised by C. H. THURBER.

Colombia: a South American republic, occupying the northwestern portion of the continent, and including the isthmus of Panama in Central America; bounded N. by Costa Rica and the Caribbean Sea, E. by Venezuela and Brazil, S. by Brazil and Ecuador, and W. by the Pacific. Area, by official figures, about 514,000 sq. miles; estimated population (1895) 5,000,000. It should be remembered that the limits with neighboring states are all unsettled. The Costa Rican boundary and a portion of the Venezuelan are approximately established; but vast portions of the southeastern plain are claimed, with about equal justice, by Venezuela, Brazil, and Ecuador. These regions are unexplored, and it will be impossible to settle the division of them for a long time to come. This does not, however, affect the statistics of population, the disputed lands being occupied only by wild Indians.

Topography.—The Andes, entering from Ecuador, divide in Southwestern Colombia into three great branches: the Western, Central, and Eastern Cordilleras. The Western Cordillera, at first parallel to the Pacific coast, recedes from it northward and becomes lower and broken until it dies out E. of the Gulf of Darien. The Central Cordillera is the culminating range, many of the peaks rising above the snow limit; separating the valleys of the Cauca and Magdalena, it is continued nearly to the junction of those rivers. The Eastern Cordillera, properly a branch of the Central one, takes a general N. N. E. direction until it passes into Venezuela S. of Lake Maracaybo; it has few very lofty peaks, but broadens out into elevated hilly regions and plateaus from 5,000 to 12,000 feet high, the finest and most thickly populated portions of Colombia. A branch extends northward on the Venezuelan frontier, nearly to the sea. W. of the northern extremity of this branch, on the Caribbean coast, is an isolated mountain region with a culminating mass, the Sierra Nevada de Santa Marta, 17,018 feet high (Brettes and Nuñes, 1891). Tolima, in the Central Cordillera, attains 18,426 feet, and is probably the highest peak in Colombia. The ISTHMUS OF PANAMA (*q. v.*) is hilly rather than mountainous, and its central ridge is much broken. A branch of the Panama hills is continued southward along the Pacific coast to about lat. 5°. Farther S. the coast region is low and often swampy.

Between the mountain-ranges and their attendant table-lands are three great north and south depressions, the valleys of three rivers which flow to the Caribbean Sea. The westernmost and smallest of these is the Atrato valley, between the Western Cordillera and the coast range, and hardly separated at its head from the San Juan valley, which opens to the Pacific. The whole Atrato depression is low, and much of it is swampy. The Cauca and Magdalena depressions occupy the spaces respectively between the Western and Central and the Central and Eastern Cordilleras; broadening out northward, they unite in the great plains of the Caribbean coast, with wide flood-lands along the rivers.

From the Eastern Cordillera a table-land of unknown extent stretches E. and S., with an average elevation of 1,500 or 2,000 feet, and with several ranges of higher hills. This table-land is similar to the plateaus of Brazil and Guiana, and structurally may be regarded as a portion of them. It is cut deeply by river-valleys, and the edges fall abruptly to the low plains of the Amazon and Orinoco, an immense, trackless forest. The escarpments are the so-called Caquetá Mountains.

Rivers.—The MAGDALENA (*q. v.*) is the great interior highway, small steamers and boats ascending it to Honda, not far from Bogotá. Its tributary, the Cauca, is navigable for a considerable distance. The Atrato has been described as a moving swamp; it is partly covered with floating vegetation, but there is generally a clear channel, and steamers can ascend it during the floods. On the Pacific side there are no important rivers. Colombia lays a vague claim to the northern shore of the Amazon from the Napo nearly to the Rio Negro, with the whole of the great branches, the Putumayo or Içá, and the Caquetá or Japurá. Both of these branches are navigable, and their upper courses are certainly in Colombian territory. At present they are frequented only by Brazilian rubber-gatherers; river steamers of the Amazonian Company ascend them for some distance in the rubber season, and occasional travelers have reached the highlands of Colombia by the Içá. There can be no doubt of their future importance as channels of communication. The Uapés, flowing into the Rio Negro, and the Guaviare and Meta, branches of the Orinoco, are hardly less important. Numberless smaller streams in these plains are as yet unexplored.

Volcanoes and Earthquakes.—In Southeastern Colombia there is a group of active and extinct volcanoes, the most important being Puracé (near Popayan), Huila, Azufral, Pasto, and Chiles. Tolima and other peaks of the Central and Western Cordilleras are extinct volcanoes. All the mountain region is subject to earthquakes.

Climate.—This varies extremely in different parts, not only with the elevation, but as the winds have free access or are cut off by the mountain-chains. Generally speaking, the coasts, lower river-valleys, and the northern and southeastern plains are hot, damp, and in parts very unhealthful; the central plateaus and mountain-flanks have a delightful temperate climate, with abundant rains. In Southwestern Colombia some of the elevated plains are so dry as to be practically deserts.

Vegetation.—In proportion to its area Colombia has more forest than any other country in South America. The Isth-

mus of Panama, the Pacific, and Caribbean coasts, the valleys of the northern rivers, and the great southwestern plains are all covered with dense tropical growth, and similar forests extend far up the mountain-sides. On the plateau they give place, where the land has not been cleared, to woods of oaks and other trees of temperate climates, and still higher to pines. E. of the Eastern Cordilleras are extensive llanos, or grassy plains, occupying much of the Caquetá table-lands and continuous with those of Venezuela. The low flat lands extending from the lower Magdalena around the southern side of the Santa Marta Mountains are in great part covered with grass, and there are similar plains W. of the Magdalena.

Minerals.—Gold and silver are almost the only metals extracted, and the mountain regions are rich in both. The principal gold district is in the central department of Antioquia, between the Cauca and Magdalena, where the present annual production is about $2,000,000; the entire gold output of Colombia is about $3,000,000. The yearly output of silver is valued at about $1,250,000, the richest mines being in Tolima and Cauca. During the colonial period the yield of precious metals was very large. Copper, lead, and platinum exist, but are not extensively mined. The emerald mines of Muso, department of Boyacá, are the richest in the world, and the principal source from which this gem is obtained. Coal-beds are reported in various parts of the country, and there are extensive beds of rock-salt and salines, at present worked only for home consumption.

Plants and Animals.—These have a general resemblance to those of other parts of tropical America. (See AMERICA, SOUTH.) The number and variety of species of both is wonderful; Colombia has been called the paradise of naturalists. The birds and insects are especially numerous and beautiful. Among the common mammalia are jaguars, tapirs, deer, wild hogs, monkeys, ant-eaters, and in the mountains bears and llamas. The forest products include rubber, cinchona, ivory nuts, vanilla, mahogany, and other cabinet woods, and various drugs.

People and Government.—The civilized population is confined to the northern and western portions, and in great part to the highlands and plateaus. E. of the Cordilleras the vast forests are inhabited only by savage Indians, and but small portions have ever been explored; the Panama isthmus and the lower river-valleys are very thinly populated. The chief towns are Bogotá, the capital (120,000 inhabitants); Medellin (40,000); Bucaramanga (20,000); Cali (16,000); and the ports of Panama (30,000) and Cartagena (20,000). Probably three-fourths of the people are of Indian or mixed race; the African element is small. Spanish is the universal language, except with uncivilized Indians. Colombia is a centralized republic, somewhat resembling France in theory. The president and vice-president are chosen by an electoral college for six years, and the ministers, nominated by the president, are theoretically responsible to the senate for their acts. There is a council of state of six members. Congress consists of a senate and house of representatives. There are twenty-seven senators, chosen by the departmental legislatures, three from each department, and one representative for every 50,000 inhabitants; the suffrage is limited by educational and property qualifications. Practically, the president has almost absolute power, the more so as he is eligible to immediate re-election. The country is divided into nine departments (corresponding nearly to the old states), each with a governor appointed by the president, and an assembly elected by the people. The department of Panama, however, is ruled directly by the national government. The state religion is Roman Catholic, but other sects are tolerated. There have been great improvements in the educational system. Nearly 100,000 pupils are taught in the public schools, and there are numerous private schools. The state supports 14 normal schools; there are 3 universities, several seminaries, good libraries in some of the cities, and an observatory at Bogotá. The legal system of weights and measures is the metric.

Finances.—Interior debt (1900) about $11,359,074; foreign debt, $17,080,188. The estimated revenue for the fiscal year 1899–1900 was $29,918,640, and the estimated expenditure $29,918,640. These figures do not include the finances of the departments. The peso is nominally a dollar, but is actually worth from 50 to 85 cents, depending on the coinage. Gold is no longer coined; the circulating medium is silver and paper.

Industry and Commerce.—Agriculture and grazing are the principal industries, and do little more than supply the home demand. Manioc, plantains, sugar-cane, cacao, and tropical fruits in the lowlands, coffee and tobacco on the slopes, and maize, potatoes, beans, etc., on the plateaus, are the common crops. Extensive herds of cattle, and smaller ones of horses and mules, are pastured on the llanos. Coarse cotton and woolen cloths, unrefined sugar, molasses and rum, cigars, leather-work, furniture, and hats are about the only manufactures. The annual exports average about $15,000,000, the principal items being coffee, gold, silver, hides, tobacco, cacao, india-rubber, and cabinet woods. The largest export and import trade is with Great Britain. In 1900 the imports from the U. S. were officially valued at $2,710,688, and the exports to that country at $4,307,814. The transit commerce across the Isthmus of Panama is free of duty, and exceeds $90,000,000 annually.

Colombia has as yet very few railroads, consisting of the Panama line and a few short isolated tracks, connecting the cities with navigable waterways. In 1898 the aggregate in operation was 389 miles. Interior commerce is mainly by the rivers and by ox-carts and mule-trains, often over very bad roads.

History.—Before the conquest the highlands about Bogotá were dominated by the Chibcha or Muysca Indians, a powerful tribe which had attained some degree of civilization. (See CHIBCHAS.) The lowlands and coasts were inhabited by savage hordes. The northern coast was discovered by Bastidas in 1500, and Columbus followed the shores of Panama in 1502. Darien was founded in 1510 and Panama, Santa Marta, Cartagena, and Nombre de Dios within a few years after. In 1535 Benalcazar marched N. from Quito and conquered Popayan, and in 1536 Queseda, at the head of a band of Spaniards from Santa Marta, reached and captured the Chibcha capital. On the highlands of Bogotá, Queseda, Benalcazar, and a third band, that of Federmann from Venezuela, met, and their united forces soon reduced the Indians. Spanish settlements rapidly sprung up. For a long time the provinces of this region were subordinate to the Viceroys of Peru; but in 1740 the viceroyalty of New Granada was formed, including the present Colombia, to which Quito and Venezuela were attached later. An insurrection against Spain began in 1811, following that of Venezuela in the general revolution in Spanish South America. The first movement was crushed, and hundreds of patriots were shot in cold blood; but the war broke out again, and on Aug. 7, 1819, Bolivar's victory at Boyacá opened his way to the capital. In December of that year Venezuela and New Granada were united in the republic of Colombia, with Bolivar at the head; Ecuador was annexed soon after. The union was dissolved in 1831, and the republic of New Granada was formed. But the country was in a restless state; political struggles and revolutions followed, and the form of government was modified or changed as the federalists or centralists were in power. In 1861 a federal constitution was adopted, and the country took the name of the United States of Colombia. The present constitution dates from 1886.

AUTHORITIES.—Vergara y Velasco, *Geografía de Colombia*; Reclus, *Nouvelle Géographie Universelle*, vol. xviii., 1893; Bureau of the American Republics, *Bulletin No. 33*, Jan., 1892; Acosta, *Compendio historico del Descubrimiento y Colonización de la Nueva Granada* (Paris, 1848); Restrepo, *Historia de la revolución de la República de Colombia* (Besançon, 1858). HERBERT H. SMITH.

Colom'bo: a seaport-town and the capital of Ceylon; on its west coast, in lat. 6° 55′ N. and lon. 79° 45′ E.; near a rocky headland, the *Jovis extremum* of Ptolemy (see map of S. India, ref. 8–E). It is fortified and defended by seven batteries, besides several bastions, etc. The harbor is small, and is only safe during the southeast monsoon. The mean temperature is about 80° F., and the average annual rainfall is 72·4 inches. Colombo has a lighthouse, a military hospital, a government-house, and churches for the English, Dutch, and Portuguese. The houses are mostly of one story, each having a veranda in front. Many of the Europeans reside in the suburb Colpetty. Most of the foreign trade of Ceylon is transacted at this port. It was occupied by the Portuguese in 1517, taken by the Dutch in 1603, and conquered in 1796 by the British, who still possess it. Pop. (1891) 126,926. See Carpenter, *From Adam's Peak to Elephanta* (1892).

Colombo, REALDO: Italian anatomist; b. at Cremona; succeeded Vesalius as professor at Padua in 1544; was re-

puted discoverer of pulmonary circulation. He wrote *De Re Anatomica*, an important work (1559). D. about 1576.

Colombo Root: the root of *Jateorhiza palmata*, a menispermaceous vine from Eastern Africa. It contains colombin, berberine, and colomic acid, starch, coloring-matter, etc. It is one of the most useful of the mild tonics.

Co'lon (in Lat. *colon*; Gr. κῶλον): in anatomy, that part of the large intestine which leads from the cæcum to the rectum. In the adult of the human species it is about 4½ feet long, and consists of four portions—the right or ascending, the transverse, and the descending colon, and the sigmoid flexure (so called from its resemblance in shape to the ancient form C of the Greek letter *sigma*, Σ). The colon, owing to the peculiar arrangement of its muscular fibers, consists of a series of pouches which serve to detain the contents of the intestines on their way to the rectum. The colon is provided with numerous glands, which assist in removing the waste matters from the blood. It is believed also to have the power to some extent of digesting food; and it is certain that persons who are unable to swallow food have often been kept alive for a long time by nourishing liquids thrown into the intestinal canal by enemata.

Colon, kō-lōn′, Colombia: See ASPINWALL.

Colon: a territory of Venezuela, comprising the islands lying off the state of Guzman Blanco, in about lat. 12° N., and between lons. 66° and 68° W. It consists of the two groups Aves (birds) and Roques (rooks), and the island of Orchilla. The capital is on the Gran Roque, but it consists of little but the administrative buildings. The total area is 166 sq. miles. Pop. (1890) 238, chiefly fishermen.

M. W. H.

Colon: a northeastern department of Honduras; bounded N. and N. E. by the Caribbean Sea, S. by Olancho and Yoro, and W. by Yoro. Area, 7,000 sq. miles. It includes all the northern coast E. of lon. 87° 10′. The coast lands and most of the eastern portion are low, flat, and unhealthy; the interior is diversified by mountain-ridges with fertile valleys between. Much of the surface is covered with forest, and mahogany-cutting and rubber-gathering are the principal industries. Pop. less than 15,000, besides a few thousand wild Indians. Capital, Truxillo.

HERBERT H. SMITH.

Colon de Portogallo, PEDRO NUÑO, de: a Spanish nobleman; b. about 1600. He was a descendant of Christopher Columbus, and inherited from his line the titles of Duke of Veragua and Marquis of Jamaica. These titles were contested in 1620 by Luis de Avila, another descendant, but after a lawsuit, continued until 1664, the claim was settled in favor of Pedro Nuño. He was appointed twenty-sixth Viceroy of Mexico in 1763, but died six days after taking the office at Mexico city, Dec. 13, 1673. HERBERT H. SMITH.

Colonel, kėr′nel [in sixteenth century *coronel*, whence the present pronunciation = Fr. *coronel*, by dissimilation of *l-l* from Ital. *colonello*, chief or commander of a column, deriv. of *colonna*, column]: a military title formerly applied to the chief of a body of men varying in size from a band of partisans to a brigade or division. For many years it has been restricted to the commander of a regiment whose rank is next below that of a general. With the modern organization of regiments into battalions commanded by majors, the personal presence and voice of the colonel can no longer direct all the men of the regiment, and his command on the field assimilates more nearly to that held by a brigadier-general. As the regiment is still the administrative and historical unit, however, he still retains his position as its responsible head, and is permanently attached to it.

Colonia: a department of Uruguay; occupying the southwestern part, with a coast of about 180 miles on the Plata and Uruguay. Area, 2,193 sq. miles. Portions of the northern and eastern parts are covered by high hills, and are somewhat sterile; the remainder consists of beautiful grassy plains well adapted for agriculture and grazing. Cattle raising and wheat culture are the principal industries. There are several thriving immigrant colonies. Pop. (1890) 38,233. Capital, Colonia. HERBERT H. SMITH.

Colonia: town of Uruguay; capital of department of same name; on the Rio de la Plata (see map of South America, ref. 8–E). It has one of the best harbors of the Platine estuary, and is regarded as an important strategic point. The trade is considerable, small steamers plying daily to Buenos Ayres and Montevideo. A submarine railway and graving-dock have been constructed here. Colonia is one of the oldest towns on the Plata. In 1670 the Portuguese from Brazil formed a settlement here which they called Colonia do Sacramento. The Spanish disputed their right to the place, and it was long a bone of contention between the two governments. It was more than once bombarded, and in 1777 was quite destroyed. In 1807 it was occupied by the English. The present population is about 2,000.

HERBERT H. SMITH.

Colonial Congress, The First: the Congress held in the city of New York in May, 1690. Immediately after the attack on Schenectady the government of Massachusetts sent a circular letter to all the colonies as far S. as Maryland, inviting them to send commissioners to New York to discuss and adopt some common plan of defense; and, indeed, the Congress, consisting of delegates from Massachusetts, Connecticut, and New York, planned the campaign against Canada.

Colonial System: the restriction of the trade between a mother country and its colonies to the ships, agencies, and channels of that nationality only. This policy was thought to bind the colony closer to its parent; to keep in their hands jointly all the profits of their commercial intercourse; also to build up a commercial marine as a reservoir for ships and men in time of war. Now in case of war with an important naval power like England, the connection between the parent and its colonies became very hazardous. So it became the practice under such circumstances to throw this colonial trade open to the neutral. To meet this the British prize courts put in force what is called the rule of 1756. Neutral ships taking part in time of war in a carrying trade closed to them in time of peace were considered by this theory to have become so identified with the interests of the belligerent as to have become incorporated into his commercial marine, and therefore to be subject to capture. This rule in turn was evaded by the neutral ship-owner by touching at some home port on the voyage between colony and mother state and going through the form of trans-shipment. The British admiralty courts cut away this defense by applying the doctrine of *continuous voyages*. By this the character of the voyage was not held to be altered in spite of the touching and entry of goods at an intermediate neutral port. The voyage was one continuous voyage between the colony and its parent, nevertheless. Unrestricted trade between all countries has long since done away with the colonial system, though perhaps the policy of permitting the coasting trade of a country to be engaged in only by its ships may be considered a survival of its spirit. See CONTINUOUS VOYAGES. THEODORE S. WOOLSEY.

Colonization Society: See LIBERIA.

Colon'na: the name of a celebrated noble and powerful Roman family which has produced many eminent generals, ecclesiastics, cardinals, and authors. This family acquired distinction as early as the twelfth century. In the succeeding centuries they were adherents of the Ghibelline party. Otho Colonna was elected pope in 1417. (See MARTIN V.) The Colonna Palace in Rome is celebrated for its rich treasures of art.

Colonna, Cape: See CAPE COLONNA.

Colonna, Fra FRANCESCO: a Dominican monk; b. at Venice about 1449; Professor of Theology at Padua, and author of a work, *Hypnerotomachia Poliphili* (1499), a singular *mélange* of fables, antiquities, and architecture, which Symonds (*Renaissance in Italy*, vol. iv.) regards as a kind of epitome of the spirit of the early Renaissance. D. in 1527. A. R. M.

Colonna, VITTORIA: Italian poet; b. in 1490; daughter of the grand constable of Naples. She made an early marriage (Dec. 27, 1509) with Ferrante d'Avalos, Marquis of Pescara, who became later one of the most noted soldiers of his time. Her fame, however, is due in the first place to her own poetical gifts, and in the second place to the fact that aged Michael Angelo conceived for her an affection which made of her, as it were, the Beatrice or Laura of his declining years. Her earlier poetry was the outcome of love and admiration for a husband who had little affection to give her in return, and who, in fact, had a character of very mixed quality. Nevertheless, after his death (Nov. 25, 1525), she idealized him and celebrated him in ardent lyrics. Later in her widowhood religious impulses acquired ascendency over her, and her *Rime Spirituali* constitute perhaps the most important part of her poetical achievement. She was,

however, a woman of broad culture, familiar with the then new-found world of classical literature and art, interested in the philosophy of the ancients as well as in the teachings of the Church. She found sympathy from Michael Angelo both on the side of art and on that of her religious aspirations. He admired and celebrated her both while she lived and after her death. D. Feb. 25, 1547. See *Vittoria Colonna, Rime e Lettere* (Florence, 1860); Giuseppe Campori, *Vittoria Colonna* (Modena, 1878); A. v. Reumont, *Vittoria Colonna. Leben Dichten, Glauben im 16 Jahrhundert* (1881); Mrs. Henry Roscoe, *Vittoria Colonna, her Life and Poems* (1868). A. R. Marsh.

Colonnade [Fr. deriv. of *colonne*, column]: an architectural feature; a row of columns with all that goes with them, as the entablature above, the stylobate (if any) below, sometimes the space inclosed behind them, with its roof, etc.

Colony [from Lat. *colo'nia*; deriv. of *colo'nus*, planter, farmer]: a foreign settlement formed by emigrants under the protection or control of the mother country. The term is no longer limited to its original meaning of a body of farmers or cultivators (*coloni*), but includes any group of settlers whatever be their purpose or occupation, so long as they remain in any form of political dependence upon the home country, and it is sometimes loosely applied to such a settlement even after the tie between it and the parent state is broken. The chief colonizing nations of antiquity were the Phœnicians, Carthaginians, Greeks, and Romans. The Phœnicians established their colonies as commercial outposts on the coasts of the Mediterranean as far west as Spain, and traces of a Phœnician settlement have been found in the island of Britain, where the tin mines of Cornwall are said to have been worked by their colonists. Carthage, itself a Phœnician colony, became an independent state, and founded colonies of its own which added greatly to its commercial power. The Greeks began to plant colonies before the beginning of authentic history, and the Æolian, Dorian, and Ionian settlements in Asia Minor, named according to the tribes from which they sprang, were bound by no definite political ties to the people of Greece proper, though they recognized them as kinsfolk. The same is true of Magna Græcia (Southern Italy), and of Syracuse in Sicily. With Rome, however, colonization was for political rather than commercial ends. It was a part of her system of universal dominion, the means by which she Romanized her conquered provinces and fused them into an empire. Each new conquest was followed by the planting of colonies, which were not permitted to forget their origin or establish their independence. From the fall of Rome to the end of the Dark Ages no colonies in the proper sense of the word were established, though the map of Europe was frequently changed by the migration of whole peoples. With the rise of the Italian cities colonization was renewed and Venice and Genoa owed their main strength to their colonies in the Levant. After the voyages of Columbus and Da Gama, the nations of Western Europe took the lead in colonization. Portugal planted colonies in Africa, India, and South America; Spain in North and South America and the West Indies; while England, France, and Holland contended with varying success for a share of the new lands. In the sixteenth century Spain's colonial dominion was the greatest in the world and she herself the wealthiest nation. While the Christianization of the natives was a part of her general scheme, the paramount object was the enrichment of the mother country, and little concern was felt for the welfare of either natives or colonists. This policy, carried out by those restrictions on colonial trade which made up the so-called Colonial System (*q. v.*), was common to all these nations. The decline of Spain's colonial power began in the seventeenth century and continued steadily, until, in the early part of the nineteenth century, she lost all her South American colonies; while Great Britain, after driving the French and the Dutch from India, and the French from Canada (1763), succeeded to her place, becoming, as she has since remained, the greatest colonial empire in the world.

For details, see Leroy Beaulieu, *De la Colonization chez les Peuples modernes* (1886). F. M. Colby.

Col'ophon [from Lat. *colophon*, finishing stroke = Gr. κολοφών]: an inscription, monogram, or other design placed on the last page of a book. The colophon formerly gave the date, printer's name, etc., with much of the information now conveyed on the title-page.

Colophon (Gr. Κολοφών): an ancient Greek city of Ionia, in Asia Minor; on the river Ales or Halesus; about 9 miles N. of Ephesus. It was one of the seven cities which claimed the honor of being the native place of Homer.

Col'ophony [from Lat. *Colopho'nia re'sina*, resin of Colophon, its former place of export]: resin of pine; rosin: a name now obsolescent. See Rosin.

Color: The structure of the eye and of the elaborate nervous system connected with it enables us to distinguish form and degrees of light and shade, and in addition to these to recognize differences in the *quality* of the light which falls upon the retina. This power of distinguishing between kinds of light constitutes the color-sense. The sense of color has often been compared with that by means of which we distinguish the pitch and *timbre* of musical notes, but the analogy is not a very close one. In many respects the function of the eye seems much more complex and highly developed. The entire group of light waves which affect the retina are comprised within a single octave, so that the range of sensibility of the eye may be said to be less than that of the ear. Within that narrow range, however, at least 1,000 monochromatic tints are distinguishable. These may be taken in combination with each other and with white, the total number of distinct color-impressions thus capable of being formed being very large (according to Rood, about 2,000,000). The sensitiveness of the eye to dilute mixtures of coloring-matter with white is astonishing. The average observer of fifty-four persons whose power in this respect was tested could detect the presence of

25·2 parts of red lead in 100,000,000 of white;
23·9 " chromate of lead in 100,000,000 of white;
864·2 " chromic oxide in 100,000,000 of white;
126·5 " ultramarine in 100,000,000 of white.

Nichols, *American Journal of Science*, vol. xxx., p. 39.

The amount of energy which is necessary to produce vision is even less than that which will give the impression of color. Langley found that when the energy of a light ray of green reached 0·0000001 erg, an observer became aware of its action, but that the wave-length as indicated by the color could not be detected until the ray was much stronger.

Complicated as color-effects at first appear to be, it is found that they can all be explained as the resultant of three primary color-sensations: the sense of red, of green, and of violet. It is generally assumed that there is a triple mechanism in the nervous system of the eye, by means of which these three fundamental sensations are received and transmitted to the brain. The absence of one of them, usually that of red or green, constitutes "color-blindness" or Daltonism. The color-blind eye, then, possesses a color system which depends upon *two*, the normal eye a system which involves *three*, primary sensations.

Whenever, in the case of the normal eye, all three primary impressions are produced in equal strength, the resultant is white. All other colors, even those induced by monochromatic light, differ from white simply in the relative strength of the three components.

The chief source of color in external objects is the selective absorption of the different wave-lengths of light by the various substances in question.

Selective absorption is a property common, so far as known, to all forms of matter. Light reflected by the surface-layer is, in general, unchanged in composition. This, however, is only a small portion of the light which the body reflects. The greater part penetrates the body and is reflected from within. In its path within the substance the various wave-lengths which go to make up the incident ray suffer loss in various degrees. Some, to which the body is opaque, will be entirely suppressed; others will pass with but little diminution of brightness. The result is that the ray finally reflected and reaching the observer's eye differs more or less in composition from the incident ray, and it is upon this difference that the color of the body depends. A body reflecting light without modification would be a *true white*. No such body, so far as known, exists. A body which absorbs all light reaching it and reflects none would be a *perfectly black* body. The nearest approach to such a perfect black is probably lampblack, but the reflection from it amounts to nearly 3 per cent. It should be described as a white of low intensity. Lampblack illuminated by direct sunlight is as bright as the average cloudless sky at 45° from the sun.

A monochromatic tint in color is one produced by some ray of single-wave length. Such are the colors of the pure spectrum. The colors of the spectrum, however, are not simple, from the physiological point of view, since each sep-

COLORADO

Scale of Miles
0 10 20 30 40
County Towns

Longitude 106 West from Greenwich

L.L. POATES, ENGR., N.Y.

arate wave-length of the visible spectrum excites, in some degree, all three of the primary color-sensations already described, so that the resulting impression is of the same degree of complexity as that due to sunlight or to any ordinary source.

The color of pigments is never even approximately monochromatic. It is always simply white, with certain wave-lengths weakened by absorption within the body of the pigment itself.

Next to selective absorption, and scarcely secondary to it as a source of color, is *diffraction*. To the class of diffraction colors belong the tints of the bubble and of all thin films, the colors of mother-of-pearl, of the brilliant tropical beetles, and much of the coloring in insect life. Also to this class belong the hues presented by the plumage of the humming-bird, and, indeed, all those colors in nature to which the term "iridescent" may be applied. Color in these cases is due to *interference* of the light rays reflected from the surfaces in question. See COLOR-BLINDNESS, COMPLEMENTARY COLORS, INTERFERENCE OF LIGHT, OPTICS, and THIN PLATES, COLORS OF. See also Rood's *Text-book of Color*; Church's *Chemistry of Paints and Painting*; Campbell and Garnett's *Life of James Clark Maxwell* (part ii.); Abney and Festing in *Trans. Royal Soc.* (vol. clxxix.); Nichols and Snow in *Phil. Mag.* (vol. xxxii., series 5, p. 401).

EDWARD L. NICHOLS.

Colors, Accidental: colors depending on the momentary fatigue of a portion of the retina for any color to which it has been exposed. Neutral surfaces then appear of a shade complementary to that which produced the fatigue. If we look for a short time steadily with one eye upon any bright-colored spot, as a wafer on a sheet of white paper, and immediately after turn the same eye to another part of the paper, a similar spot will be seen, but of a different color. If the wafer be red, the imaginary spot will be green; if blue, it will be changed into yellow; the color thus appearing being always what is termed the complementary color of that on which the eye was fixed.

Colorado, kol-ō-raa'dō: a river of Texas; rises in the high table-lands in the northwestern part of the State. Its general direction is southeastward. It passes by Austin City, Bastrop, and Columbus, and enters Matagorda Bay near the town of Matagorda. Total length estimated at 850 miles. Steamboats can ascend it above Austin City.

Colorado (called the "Centennial State," because admitted into the Union in 1876): a central State of the "New West"; between 37° and 41° N. lat. and 102° and 109° W. lon.; 280 miles from N. to S. and 370 from E. to W. Area, 103,925 sq. miles; equal to New York, Pennsylvania, New Jersey, and Delaware.

Colorado seal.

Colorado, by census of 1900, ranked thirty-first among the States in population.

Topography and Surface. — The Great Plains, from the Missouri river to the Rocky Mountains, rise gradually till at the foot-hills they are 6,000 to 7,000 feet high. The east third of Colorado belongs to this lofty plateau; the Rocky Mountains and their parks and the valleys beyond occupy the rest of the State. The principal chains are Colorado Front range; North Colorado or main range, uniting at South Park with Front and Saguache ranges, and forming Sangre de Cristo range; the Park range, W. of the great parks; the Saguache range, which is now conceded to be the Great Divide of the Rocky Mountains; W. of this, numerous spurs and short chains running N. W., W., and S. W., and beyond and between them a lofty plateau extending to the east wall of the great Utah basin. Through this plateau the Grand, Green, and Gunnison rivers, affluents of the Colorado of the West, cut their deep cañons. The parks, of which the North, Middle, South, San Luis, Egeria, Estes, Animas, and Huerfano are the largest, are broad valleys, originally the beds of inland lakes or seas. There are about forty peaks in Colorado over 14,000 feet, and some hundreds between 11,000 and 14,000 feet high. The rivers of Colorado are the north fork of Platte, South Platte, Republican, Arkansas, Rio Grande, San Juan, Gunnison, Grand, White, Green, and their affluents. None of these is navigable. The cañons of the Arkansas, Rio Grande, San Juan, Gunnison, Grand, and Green are from 2,000 to 5,000 feet deep, and of wonderful and terrible magnificence. Wonderful results of ages of erosion can be seen in the "City of the Gods" in the N. W., the "Garden of the Gods," etc. There are numerous small lakes; San Luis is the largest.

Minerals.—Gold and silver are found in about two-thirds of the counties of the State; copper alone and with gold, lead alone and with both silver and gold, zinc alone and with silver, iron with gold and alone in great quantities; platina, quicksilver, tellurium in combination with gold, silver, and copper; coal, both bituminous and anthracite (the latter probably from the Tertiary altered by volcanic action); gypsum, salt, kaolin, pottery clays, and many precious stones.

Vegetation and Soil.—The arable lands of Colorado comprise 15,000 miles or more of its area, and the grazing lands at least 70,000 miles or more. The arable lands are generally fertile, but most of them require irrigation, and produce enormous crops under its influence. The grazing lands require less water—only enough to water the flocks and herds. Some of the irrigating canals, both in the north and south parts of Colorado, are very large and long. One, of an English company, is 54 miles long; another 34 miles; others less. The mountain-slopes are generally covered with forests of pine, spruce, fir, etc., but the consumption of timber is enormous. The native grasses of Colorado are rich and nutritious; the flowers mostly sub-alpine, but very beautiful.

Animals.—The grizzly bear W. of Rocky Mountains, the black and brown bear and the jaguar in the W., the cougar in the N. W., the gray wolf E. and W., the prairie wolf E. of Rocky Mountains; the elk (wapiti), Virginia, and mule deer are numerous; antelope frequent the plains; the big-horn or mountain sheep and the Rocky Mountain goat are found in the mountains, and all the rodents and munchers are numerous. The buffalo formerly ranged over the grand parks and along the extensive plains. Birds of prey and game-birds are very plentiful, and song-birds in the mountains. The Rocky Mountain locust and the Colorado beetle, or potato-bug, if originating here, do most of their mischief elsewhere. There are remarkable fossils of mammals and reptiles. The returns of 1899 report 145,713 horses, 8,580 mules and asses, 1,115,421 cattle, and 2,185,327 sheep. The value of live stock in 1899 in Colorado was $42,400,146.

Climate.—Owing to the general elevation, the climate of Colorado is temperate; rather too cool than too hot. The mean annual temperature of the towns, which range from 5,000 to 11,000 feet above the sea, is from 48·5° to 49·3°; summer mean, 64·6° to 69·2°; winter mean, 31·3° to 32·8°; extremes, 93° to 99° maximum in summer, with from six to thirty days, according to elevation, above 90°; minimum in winter, — 3° to — 12°, with an average of six to twenty days below zero. The nights are always cool; average rainfall, 18·84 inches, which is increasing. Consumptives do well if they do not seek an elevation much above 6,000 feet, and if they remain there.

Industries.—Agriculture is an important industry, especially in the northeastern part of the State, where the conditions under which agricultural operations are carried on are similar to those in the western portions of Kansas and Nebraska. The total area under cultivation in 1900 was 1,434,412 acres; the total value of products $22,448,178. In 1900 Colorado produced: wheat, 7,207,117 bush.; corn, 3,188,941 bush.; oats, 3,272,390 bush.; barley, 314,266 bush.; rye, 39,480 bush.; potatoes, 1,863,288 bush.; hay, 1,783,133 tons. Fruit culture is extensively carried on. The mining, smelting, and reducing of the precious and other metals have made the State a prominent one. Gold-mining has passed through three stages since 1859—placer and hydraulic mining; refractory ores, sulphurets, and tellurides of gold and iron; and the present era of free milling gold and easily reducible ores. In silver-mining there has been a constant succession of surprises. Sulphurets of lead and silver, the argentiferous galena so common elsewhere, do not abound in Colorado, but instead there are silver and

copper, silver and zinc, silver and iron, ruby silver, horn silver, silver with manganese and iron, chloride of silver, tellurides, and, largest and best of all, carbonates of lead and silver. Then, too, the way in which the silver ores occurred was new. There were some pockets, some fissure veins, some chloride belts, and in and around Leadville no fissure veins, but blankets or layers of carbonate of lead charged more or less with silver and of great extent, but not of great depth. These new conditions have made silver-mining very important in Colorado, which produces more than one-third of the total yearly output of silver in the U. S. It was not till 1872 that the annual output of silver exceeded that of gold; and though the gold product has greatly increased, it is still somewhat less than that of silver. The value of gold from Colorado deposited at the mints from 1893–99 was $113,516,914, of silver $209,721,399. The product of silver in 1899 was $29,301,527, that of gold $25,-982,800. In 1899 iron ore was produced to the amount of 307,557 tons. In 1898, 91,222 tons of pig iron were manufactured. The coal industry is important; 4,776,224 tons were mined in 1899. Cattle-herding, sheep-raising and the wool traffic are active industries.

Education.—There is an excellent public-school system in Colorado: graded and high schools in the larger towns; a State university at Boulder, a college at Colorado Springs, a State agricultural college at Fort Collins, State school of mines at Golden; special schools and collegiate schools of high character. The school census of 1899 showed 143,335 children of school age, that of 1900 gave 153,634. This indicates an enrollment of over 118,000.

COUNTIES.	* Ref.	Pop. 1890.	Pop. 1900.	COUNTY TOWNS.	Pop. 1900.
Arapahoe	2-F	132,135	153,017	Denver	133,859
Archuleta	6-C	826	2,117	Pagosa Springs	367
Baca	6-G	1,479	759	Spriugfield	44
Bent	5-G	1,313	3,049	Las Animas	1,192
Boulder	2-E	14,082	23,544	Boulder	6,150
Chaffee	4-D	6,612	7,085	Buena Vista	1,006
Cheyenne	4-G	534	501	Cheyenne Wells	.....
Clear Creek	3-D	7,184	7,082	Georgetown	1,418
Conejos	6-D	7,193	8,794	Conejos	348
Costilla	6-D	3,491	4,632	San Luis	731
Custer	5-D	2,970	2,937	Silver Cliff	576
Delta	3-B	2,534	5,487	Delta	819
Dolores	5-B	1,498	1,134	Rico	811
Douglas	3-E	3,006	3,120	Castle Rock	304
Eagle	3-C	3,725	3,008	Red Cliff	256
Elbert	3-F	1,856	3,101	Kiowa	.....
El Paso	4-E	21,239	31,602	Colorado Springs	21,085
Fremont	4-D	9,156	15,636	Cañon City	3,775
Garfield	3-B	4,478	5,835	Glenwood Springs	1,350
Gilpin	2-D	5,867	6,690	Central City	3,114
Grand	2-D	604	741	Hot Sulphur Springs	60
Gunnisou	4-C	4,359	5,331	Guunison	1,200
Hinsdale	5-C	862	1,609	Lake City	700
Huerfauo	5-E	6,882	8,395	Walsenburg	1,033
Jefferson	3-E	8,450	9,306	Golden	2,152
Kiowa	4-G	1,243	701	Sheridan Lake	.....
Kit Carson	3-G	2,472	1,580	Burlington	183
Lake	3-C	14,663	18,054	Leadville	12,455
La Plata	6-B	5,509	7,016	Duraugo	3,319
Larimer	1-D	9,712	12,168	Fort Collins	3,054
Las Animas	6-F	17,208	21,842	Trinidad	5,345
Lincoln	3-F	689	926	Hugo	.....
Logan	1-G	3,070	3,292	Sterling	1,009
Mesa	3-A	4,260	9,267	Grand Junction	3,503
Mineral	5-C	.....	1,913	Creed	938
Montezuma	6-A	1,529	3,058	Cortez	125
Montrose	4-B	3,980	4,525	Montrose	1,217
Morgan	2-F	1,601	3,268	Fort Morgan	634
Otero	5-F	4,192	11,522	La Junta	2,513
Ouray	5-B	6,510	4,731	Ouray	2,196
Park	3-D	3,548	2,998	Fair Play	319
Phillips	1-G	2,642	1,583	Holyoke	451
Pitkin	3-C	8,929	7,020	Aspen	3,303
Prowers	5-H	1,969	3,766	Lamar	987
Pueblo	5-E	31,491	34,448	Pueblo	28,157
Rio Blanco	2-B	1,200	1,690	Meeker	507
Rio Grande	5-C	3,451	4,080	Del Norte	705
Routt	1-B	2,369	3,661	Hahn's Peak	.....
Saguache	5-C	3,313	3,853	Saguache	73
San Juan	5-B	1,572	2,342	Silverton	1,380
San Miguel	5-A	2,909	5,379	Telluride	2,446
Sedgwick	1-G	1,293	971	Julesburg	371
Summit	3-D	1,906	2,744	Breckinridge	976
Teller	4-E	.....	29,002	Cripple Creek	10,147
Washington	2-G	2,301	1,241	Akron	351
Weld	1-E	11,736	16,808	Greeley	3,023
Yuma	2-G	2,596	1,729	Yuma	139
Totals	.....	412,198	539,700		

* Reference for location of counties, see map of Colorado.

Churches.—All the religious denominations are well represented, the Roman Catholics perhaps leading in adherent population.

Population.—In 1860 Colorado had 34,277 inhabitants: in 1870 39,864, besides 7,480 tribal Indians; in 1880 194,327; in 1890 412,198 (white 404,468, colored 7,730, besides 612 Chinese and 1,083 Indians); in 1900 539,700; 1,700 Utes were removed to Utah in 1880, mostly living on reservations.

The *principal towns* are Denver (capital), population in 1900, 133,859; Pueblo, 28,157; Colorado Springs, 21,085; Leadville, 10,384; Cripple Creek, 10,147; Boulder, 6,150; Trinidad, 5,345; Victor, 4,986; Cañon City, 3,775; Florence, 3,728; Salida, 3,722; Grand Junction, 3,503; Durango, 3,317; Aspen, 3,303; Central City, 3,114; Fort Collins, 3,054; Greeley, 3,023; Colorado City, 2,914; Longmount, 2,201; Ouray, 2,196.

History.—Civilized Cherokees attempted to explore Colorado in 1857, but were driven back by Indians; in 1858 it was explored at two points—near Pike's Peak by a company from Kansas, and in the S. W. by Georgians under Baker, who was afterward killed by the Indians at the Colorado River; both found gold. In 1859 Clear Creek gold deposits were discovered; great emigration in 1859, 1860, and 1861. Territory organized in 1861; gold plenty, but difficult of extraction; not much silver till after 1870; fine climate and fine grazing lands; soil very rich and productive when irrigated; irrigation practiced in the N., herding in the E., and gold-mining in the central part. Attempts were made for its admission as a State in 1865–67, but were vetoed by President Johnson, and in 1873 denied by Congress; admitted in 1876, and, soon after, great discoveries of carbonates of lead and silver in Lake County turned the tide of immigration to the new State.

GOVERNORS.

Territorial.		*State.*	
William Gilpin	1861-62	Alva Adams	1887-89
John Evans	1862-65	Job A. Cooper	1889-91
Alexander Cummings	1865-67	John L. Routt	1891-93
A. Cameron Hunt	1867-69	Davis H. Waite	1893-95
Edward M. McCook	1869-73	Albert W. McIntyre	1895-97
Samuel H. Elbert	1873-74	Alva Adams	1897-99
John L. Routt	1874-76	Charles A. Thomas	1899-
State.			
John L. Routt	1876-Jan. '79		
Frederick W. Pitkin	1879-83		
James B. Grant	1883-85		
Benjamin H. Eaton	1885-87		

Colorado: city; capital of Mitchell co., Tex. (for location of county, see map of Texas, ref. 3–F); on Texas and Pacific Ry.; 230 miles W. by S. of Fort Worth; has large salt-works, and is in a wool-producing and cattle-raising district. Pop. (1890) 1582; not returned separately in 1900.

Colorado Chiquito: See Little Colorado River.

Colorado City: El Paso co., Col. (for location of county, see map of Colorado, ref. 4–E); on Denver and Rio Grande and Colorado Midland Rys.; 3 miles N. W. of Colorado Springs. Pop. (1880) 347; (1890) 1,788; (1900) 2,914.

Colorado College (Colorado Springs, Col.): the oldest institution for higher education in the Rocky Mountain region. It has four handsome stone buildings, and a gymnasium, with a campus of 56 acres. The meteorological observatory contains a number of continuous self-registering instruments. The college, which was chartered in 1873 and opened in 1874, has been completely reorganized since 1888, and its standard of work is now the same as that of the best Eastern colleges. The associate preparatory school, Cutler Academy, fits for admission to the freshman class of any college in the U. S. The Rocky Mountain region furnishes unsurpassed facilities for the study of geology, mining, metallurgy, and kindred branches; and the trustees aim to make the college a center for scientific work in all lines. Three courses of study are offered, the classical, the Latin-scientific, and the scientific.

Colorado Desert: an arid basin traversed by the Southern Pacific R. R. between Fort Yuma and San Bernardino. Its principal depression is also called the Coahuila valley and its eastern continuation is termed the Yuma desert. The lower part of the Coahuila valley, including an area of about 17,000 sq. miles in extent, lies below the level of the ocean. It was formerly part of the Gulf of California, but in prehistoric times was separated therefrom by the growth of the delta of the Colorado river, which gradually extended from E. to W. until it joined the peninsula of Lower California, and thus shut out the sea. The river now flows across the south part of its delta and contributes its water to the gulf, but at some earlier time, and probably at several different epochs, it has flowed down the northwestern side of

its delta into Coahuila valley, which was then occupied by a fresh-water lake. From this lake there was an outlet to the gulf by way of a channel known as "Hardy's Colorado," which follows the western margin of the delta. Since the occupation of the country by white men the river has occasionally, during high flood, discharged a portion of its water toward the Coahuila valley by means of a channel called New river, and in 1891 such a discharge was continued for several months, producing in the bottom of the valley a broad but shallow lake known as Salton Lake.

G. K. Gilbert.

Colorado, Rio: a river in the southern part of Argentina, rising in the Andes and flowing with a general E. S. E. course to the Atlantic near lat. 39° 50′ S. It is formed by the junction of the Barrancas and Rio Grande, and the length from the source of the latter is about 620 miles. It is navigable for vessels drawing 7 feet of water to Pichemahuida, about 200 miles. The Colorado separates the Argentine territories of Pampa and Rio Negro. Along the lower course it is bordered by pasture lands and in some places by woods. The upper river flows through an arid waste.

Herbert H. Smith.

Colorado River (of the West): a river which drains a large plateau and mountain area of Wyoming, Colorado, Utah, and Arizona, which is well watered above 8,000 feet, but is arid and desert at lower altitudes. Its head branches are the Green from the north and the Grand from the east, uniting in Southeast Utah. The Green, 450 miles long, rises in the Wind River Mountains of Wyoming, and flows south across a broad basin containing horizontal coal-bearing beds of an extinct lake, now much dissected by branch streams. The river then transects the Uinta Mountains in several deep cañons. The Grand river rises in Middle Park, on the west slope of the front range of the Rocky Mountains, Colorado, and flows west, receiving many tributaries in deep valleys and cañons. Below the junction of the Green and Grand, the Colorado erodes the plateaus of Southeast Utah and North Arizona for 180 miles, passing through the Marble Cañon, 3,600 feet deep, on the south margin of the Paria plateau, before receiving the Little Colorado river, which comes from the southeast through a cañon in the broad plateau of East Arizona. An irregular course then leads 218 miles, with only three considerable tributaries, through the Grand Cañon in the Kaibab, Kanab, Uinkaret, and Sheavwits plateaus. Passing out of the plateau province, near the southeast corner of Nevada, the Colorado enters a lower desert region, which it traverses almost without tributaries and in summer with diminishing volume for 240 miles, forming the western boundary of Arizona to the entrance of the Gila river at Fort Yuma, and thence in Mexico, 70 miles across its delta to the present head of the Gulf of California.

The geological history of the Grand Cañon is, in brief, as follows: North Arizona consists of a vast series of Carboniferous and Mesozoic marine strata, covered by a series of Eocene lacustrine beds; in all originally some 15,000 feet thick. A great dome-like uplift, central in Northwest Arizona, occurred during Eocene time, and exposed much of the Eocene and Mesozoic series to denudation, whereby they were eroded 5,000 to 10,000 feet deep over thousands of square miles, reducing the uplifted region to a lowland of moderate relief, except where the edges of the more resistant strata remained around the margin in retreating escarpments, such as the Vermilion cliffs (Trias) on the Utah-Arizona line, or where heavy volcanic cones and lava flows protected the strata beneath them, as about the San Francisco Mountains of Central Arizona or the Aquarius plateau of South Utah. The lowland of denudation thus produced was again uplifted with much volcanic action about the close of Miocene time; but this uplift dislocated the region in great blocks separated by deep fractures trending about N. and S. To the S. E. the dislocations were less apparent; there the uplifted area is called the Colorado plateau, its altitude being 7,000 to 7,500 feet. The dislocations were more marked in Northwest Arizona and Southwest Utah, forming the Wahsatch, Aquarius, and other plateaus. The wasted faces of the blocks now form rugged cliffs, 1,000 to 2,500 feet high and 30 to 76 miles long, generally facing W. The several plateaus traversed by the Grand Cañon are thus formed. The Kaibab is the highest, 7,500 to 9,300 feet; and there the river has cut down the deepest cañon, 5,000 to 6,000 feet deep, with walls 5 or 6 miles apart at the top, and greatly varied by side cañons and promontories. During the elevation of the blocks there appears to have been a pause after an uplift of about 2,000 feet; for there is a broad esplanade beneath the plateau surface, about 5 miles wide and inclosed by cliffs 2,000 feet high. It is within this esplanade that the deep and narrow cañon is sunk from 2,000 to 3,000 feet, showing a revival of uplift after the esplanade had been eroded. The dislocation of the blocks was in greater part accomplished after the esplanade was formed, for its platform is displaced by the fractures that dislocate the blocks. The cañon proper is therefore not older than Pliocene time. The location of the cañon is not only independent of the fractures that separate the plateau blocks, but the direction of river flow is in several cases against the slope given by the latest uplift to the plateau surfaces; hence it is believed that the river cut down its cañon almost as fast as the blocks were uplifted. The work of deepening and widening the cañon still progresses with geological rapidity; the river flows along level reaches, alternating with plunging rapids, averaging a fall of 5 to 12 feet to the mile in the Grand Cañon. The waste of the walls slides down in great volume every melting season. The cañon ends where the river flows out of the Sheavwits plateau, whose escarpment forms a ragged cliff face, 2,000 feet high, called the Grand Wash.

The early belief that this cañon and others of similar nature but less depth were fractures of the earth's crust was disproved by Newberry, who examined the lower part of the cañon with the Ives expedition of 1858; his conclusions were confirmed by Powell, whose party descended the river in boats ten years later; and again by Dutton, who approached the cañon from the plateaus in 1875 to 1880, and from whose report (Monograph II., U. S. Geol. Survey) this account is abridged.

The 70 miles below Fort Yuma lead the Colorado over the gentle slope of its broad delta, built across the trough of the Gulf of California. The depression of the gulf extends 100 miles farther N. W., where it is known as the Colorado desert, or the Coahuila basin; but this upper portion, cut off from the main gulf by the delta, and receiving no large rivers, is evaporated to a desert, whose surface is 200 to 300 feet below sea-level. The Southern Pacific R. R. crosses this district. At times of high flood, when a distributary of the Colorado happens to flow N. W. across the delta plain, a shallow temporary lake is formed at the lowest part of the depression, as in the summer of 1891. The course of one of the chief distributaries is known as New river. When the lake rises high enough to overflow, its waters escape along the west margin of the delta, where a channel has been cut, known as Hardy's Colorado.

W. M. Davis.

Colorado Springs: city; capital of El Paso co., Col. (for location of county, see map of Colorado, ref. 4–E); on five trunk-line railroads; 75 miles S. of Denver. It was originally Fountain Colony. The city is situated at the mouth of the Ute Pass at the foot of Pike's Peak, and is surrounded by most magnificent scenery. The proximity of the famous mineral springs at Manitou and the equableness and dryness of the climate have made the place a popular health resort. It has the State institution for the mute and the blind, a college, and good schools. Pop. (1880) 4,226; (1890) 11,140; (1900) 21,085.

Editor of "Republic."

Colorado, The University of: a State university; founded in 1876; situated amid most picturesque scenery at Boulder; on the Union Pacific R. R., 28 miles N. W. of Denver. The institution is liberally supported by direct taxation and legislative appropriations. Tuition is free; the cost of living is not great. The university presents collegiate courses leading to the bachelor's degree in arts, philosophy, science, and letters, and post-graduate courses for the corresponding master's degree and the doctor's degree. It also sustains thorough courses in medicine and law. The facilities for instruction are of the best—able faculties, excellent library, well-equipped laboratories and museum, unsurpassed hospital and clinical advantages. The Denver Medical College is a department of the university. The university admits students on approved diplomas from several high schools in the State without examination. Presidents: Joseph A. Sewall 1876–85; Horace M. Hale 1886–91; James H. Baker, Jan., 1892.

Color-blindness, or **Daltonism**: want of sensitiveness in the eye to certain color impressions. This defect is not usually accompanied with any other imperfection of vision, but it shows a peculiar tendency to transmission from

parent to child. When the nervous system of the eye is normal there are three fundamental or primary sensations —red, green, and violet. From the combinations of these in varying intensities all color impressions are formed. The absence of one of these primary sensations constitutes color-blindness. The lacking component is usually red or green, very rarely violet. Normal vision is therefore said to be "trichroic," color-blind vision to be "dichroic." About 4 per cent. of all men are either red blind or green blind; of women only a very small number possess dichroic vision. Temporary violet-blindness may be produced by doses of the drug santonin. The excessive use of tobacco also sometimes induces partial color-blindness.

Color-blindness is detected by the use of a proper selection of colored worsteds, a test which has been applied with infallible results to over 100,000 individuals in the U. S. and in Europe. The method was devised by Prof. Holmgren, of Upsala. (See COLOR.) The name of Daltonism was given to color-blindness because the distinguished John Dalton and his brothers suffered from it. See also Jeffries's *Color-blindness and its Detection*; Helmholtz, *Handbuch der physiologischen Optik*; Campbell and Garnett, *Life of Maxwell* (part ii.). E. L. NICHOLS.

Colored Methodist Episcopal Church: See METHODISM.

Coloring-matters: Nature abounds in these principles, and art has added to the number. The colored appearance is not an inherent property of the body itself, but due to its effect upon ordinary light. See COLOR.

Color-mixer and **Color-wheel**: See RECORDING APPARATUS, PSYCHOLOGICAL, in the Appendix.

Colos'sæ (in Gr. Κολοσσαί, or Κολασσαί): an ancient city of Asia Minor, situated in Phrygia, on the river Lycus. It was nearly destroyed by an earthquake in 65 A. D. St. Paul's Epistle to the Colossians was addressed, in 62 (some say 58–60) A. D., to the believers at Colossæ. Its site is about 3 miles N. of the modern *Chonas* or *Khonos*.

Colossal [from COLOSSUS (*q. v.*)]: in the fine arts, a term applied to any work remarkable for extraordinary dimensions. It is, however, more especially applied to works in sculpture. According to the Book of Daniel, the palaces of Babylon contained statues of great size, and in the ruined temples of India are statues of extraordinary dimensions. The Egyptians surpassed the Asiatics in these gigantic monuments, their chief statues of very great size being set against the outer walls of temples and often cut out of the solid rock. The taste for colossal statues prevailed also among the Greeks, some of the most notable being the chryselephantine statues (*q. v.*). The famous bronze statue of Pallas-Athena on the Acropolis at Athens was visible many miles at sea. The principal Roman colossus was the figure of Nero, representing him as the sun god, set up by himself before the Golden House; it was in bronze, the work of Zenodorus; and Pliny says it was 110 feet high.

Colosseum: See AMPHITHEATER.

Colos'sians, The Epistle of St. Paul to the: one of the books of the New Testament; written at the same time and place as the Epistles to the Ephesians and Philemon, probably during the apostle's first imprisonment at Rome, about 62 A. D. It seems to be directed against certain Jewish heresies of the Alexandrian or Gnostic type. The best commentary is that by J. B. Lightfoot (8th ed. London, 1886).

Colossus [from Gr. κολοσσός, cf. Gr. κολωνός, hill, Lat. *collis*, hill, *excel'tere*, rise up]: a statue of a size much greater than life. Modern ones are more generally called *colossal statues*, and the term colossus is applied to the gigantic figures, in Egypt and elsewhere, of antiquity. The Colossus of Rhodes was a bronze statue of Apollo, standing near the mouth of the harbor. It was thrown down by an earthquake in 224 B. C. See CHARES.

Colos'trum [Lat.]: the first milk yielded after accouchement or delivery of offspring. The colostrum of a cow is also called beestings. The colostrum contains more sugar, more butter, and rather less casein than true milk, and also contains a much greater proportion of phosphates and chlorides, which may possibly give to colostrum the evacuant properties which it is said to possess. It also has a great number of leucocytes, or "colostrum corpuscles." See MILK.

Colquhoun, kō-hoon', ARCHIBALD ROSS, A. M., C. E., F. R. G. S.: traveler; b. off the Cape of Good Hope, Mar., 1846; entered Indian Public Works Department in 1871. In 1881–82, in conjunction with Mr. Wahab, he explored Southern China and the Chinese Shan states, and in 1883–84, with Mr. Holt Hallett, the Siamese Shan states, in view of a projected railway connecting India and China and opening up Siam and Central Indo-China. On his return to England he was awarded the gold medal of the Royal Geographical Society and published *Across Chrysé*, an account of his travels, in two volumes. Appointed deputy commissioner of the Sagier district in Upper Burma in 1885, he has since endeavored to further in every possible way the proposed railways connecting China and Siam with the British possessions in India.

Colquhoun, Sir PATRICK (or MAC CHOMBAICH DE): lawyer; grandson of Patrick Colquhoun, mentioned below; b. Apr. 13, 1815; educated at Westminster, St. John's College, Cambridge, and Heidelberg, and was called to the bar in 1837. Author of *Summary of the Roman Civil Law* (4 vols., 1849–60) and *Mediæval Roman Law*, and various treatises. He was long in the diplomatic service, and was chief justice of the Supreme Court of the Ionian islands when that archipelago was owned by Great Britain. Succeeded to the baronetcy on the death of his cousin, Sir Robert Colquhoun, in 1870. D. May 18, 1891.

Colquhoun, PATRICK: a Scottish political economist; b. at Dumbarton, Mar. 14, 1745. He became a merchant in Glasgow, and promoted the manufacture of muslin in Scotland. In 1761 he went to Virginia, and in 1789 settled in London. He published *On the Population, Wealth, etc., of the British Empire*, and other works. D. Apr. 25, 1820.

Colt, SAMUEL: American inventor; b. at Hartford, Conn., July 19, 1814. He invented a pistol called a revolver, for which he obtained a patent in 1835. He began about 1848 to manufacture revolvers at Hartford, where he erected an extensive armory. Colt's revolvers soon attained a world-wide reputation. (See REVOLVER.) D. Jan. 10, 1862.

Colton: city; San Bernardino co., Cal. (for location of county, see map of California, ref. 12–G); on the So. Pac. and the So. Cal. R. Rs.; 48 miles from Los Angeles. The city has good schools, four churches, fruit cannery and packing-house, cement-works, marble and lime works, brick-kilns, flouring-mill, winery, electric lights, and electric railway to Riverside and San Bernardino, and artesian wells. It has an elevation of 1,000 feet above the sea-level and a dry, mild climate. Fruit culture is the principal industry. Pop. (1880) about 150; (1890) 1,315; (1900) 1,309.

EDITOR OF "NEWS."

Colub'ridæ [from *Col'uber*, the typical genus]: a family of non-poisonous snakes, containing the great majority of serpents. They have numerous teeth, but no fangs; the head is covered with plates, the tail is long, with a double row of scales on the under side, and there are no rudimentary hind legs.

The family is widely distributed, and its members are varied in their habits. Some dwell upon the ground, some climb trees, and some, like the water-snake, *Tropidonotus sipedon*, seek their food in the water. The group contains the snake consecrated to Æsculapius, *Coluber æsculapii*, and such familiar species as the green snake (*Cyclophis vernatis*), black snake (*Bascanium constrictor*), garter snake (*Eutaenia sirtalis*) and misnamed blowing viper (*Heterodon platyrhinus*). F. A. LUCAS.

Colu'go: a local name for the species of *Galeopithecus*, or FLYING LEMURS (*q. v.*).

Colum'ba, SAINT, called also SAINT COLM: missionary; b. of noble parents, probably at Gartan, County Donegal, Ireland, Dec. 7, 521. In 563 A. D. he set out on his mission to Scotland. He founded in Iona, one of the Hebrides, an abbey and college which had a high reputation. Died on the island of Iona, June 9, 597. See his *Life* by Adamnan (n. ed. by Skene, Edinburgh, 1871).

Columbæ [from Lat. *columba*, a dove]: an order of birds containing the pigeons. The skull is schizognathous and schizorhinal, and basipterygoid processes are present. The sternum is narrow, deeply keeled, and has two notches on either side, although the inner may be reduced to a mere perforation. The crop is capacious, more or less completely divided into two portions, and during the breeding season secretes a milky fluid on which, mixed with partly digested food, the young are fed. The gizzard is powerful, cæca are absent or small, and the gall bladder is generally absent. The oil gland is bare, and in some genera lacking. The base of the bill is covered with a fleshy membrane, often very conspicuous, pierced by the nostrils. The tarsi

are short, scutellate, or extensively feathered, and the feet are on the whole better fitted for perching than for scratching up the earth. The syrinx has a single pair of muscles, and the feathers are devoid of after-shafts. The young are born naked and helpless.

The order is commonly divided into five families, as follows: *Dididæ*, the extinct Dodo (*q. v.*) and its allies *Didunculidæ*, the Samoan tooth-billed pigeon; *Gouridæ*, the crowned pigeons of New Guinea; *Columbidæ*, the true pigeons, as distinguished from the *Carpophagidæ*, the brilliantly colored fruit pigeons of Australasia. See Pigeon.

F. A. Lucas.

Colum'ban, or **Columban**, Saint: Irish monk; b. in Leinster, Nov. 21, probably in 543. He founded the monastery of Luxeuil, near Besançon, in France, about 590, and was the author of a monastic rule. He was a man of real learning and genius. D. in Bobbio, Italy, Nov. 15, 615, after two years' residence there.

Columba'rium [Lat., a dove-cote; hence a place of deposit, as below, from the resemblance of the niches to holes for pigeons' nests]: a building for the storage of sepulchral urns containing ashes of the dead. Those known to us are nearly all near Rome. At epochs when bodies of the poor and slaves were burned, columbaria were built to receive their urns, sometimes by burial societies, sometimes by wealthy families for their dependents. R. S.

Columbia, or **Oregon**: a river of the U. S.; the largest American river that enters the Pacific Ocean. It rises on the western slope of the Rocky Mountains in British Columbia, about lat. 50° N. and lon. 116° W. It flows northwestward nearly 150 miles, and then southward to the State of Washington, in which it unites with a large branch called Clark's river. Below this junction it pursues a very tortuous course to the northern boundary of Oregon. From this point it flows westward in a nearly direct line, and forms the boundary between the States of Oregon and Washington until it enters the Pacific. It is a rapid stream, passing through many mountain-gorges, and its navigation is much obstructed by falls. The tide ascends to the Cascades, a series of rapids, where the river passes through the Cascade Range, 140 miles from its mouth. A jetty at its mouth now makes it possible for ocean-going vessels to enter safely and proceed as far as Portland (*q. v.*), 120 miles. At the Dalles, in Oregon, the river is contracted to a channel about 100 yards wide between basaltic rocks. Steamboats ply daily on the Columbia, both below and above the Dalles (*q. v.*). Entire length, estimated at 1,400 miles. A large affluent, called Lewis or Snake river, enters it near lat. 46° 20′ N. The scenery of the Columbia is sublime, especially where it passes through the Cascade Range.

Columbia: town; capital of Boone co., Mo. (for location of county, see map of Missouri, ref. 4–G); on Wabash R. R.; 10 miles N. of the Missouri and 24 miles E. of Boonville. It is the seat of the State university and Christian College and Stephens (Baptist) College for women. It has a library. Pop. (1880) 3,326; (1890) 4,000; (1900) 5,651.

Columbia: borough; Lancaster co., Pa. (for location of county, see map of Pennsylvania, ref. 6–H); on the Pa. and the Phil. and Reading R. Rs., and on the left bank of the Susquehanna river (here nearly 1¼ mile wide); 80 miles by railroad W. of Philadelphia. A railroad bridge across the river connects Columbia with Wrightsville. It has electric lights, water-works, 2 rolling-mills, a mill for making grooved skelps, engine and boiler works, 3 iron-furnaces, stone-works, planing-mill, laundry-machine works, and a shirt-manufactory. Here is an extensive market and dépôt for lumber, which is brought down the river by rafts. Here are also an institute for girls and a fine library. Pop. (1880) 8,312; (1890) 10,599; (1900) 12,316. Editor of "News."

Columbia: a city; capital of South Carolina and of Richland co. (for location of county, see map of South Carolina, ref. 5–E); on Southern, Atlantic Coast Line and Seaboard Air Line railways, and on the E. bank of the Congaree river, just below the confluence of the Saluda and Broad; at the head of steamboat navigation; 137 miles by railroad N. N. W. of Charleston; lat. 33° 57′ N., long. 81° 7′ W. It is the seat of South Carolina College, a State institution, founded in 1804. Columbia has a State-house, penitentiary, a State hospital for the insane, a Presbyterian theological seminary, a Presbyterian "College for Women," a Methodist female college, an Ursuline institute, several excellent high schools, and an exceptionally good system of graded schools, and many churches. Six cotton factories are in operation (three of them among the largest in the south), with 240,000 spindles and 6,000 looms, employing 4,500 operatives, and representing an investment of $4,850,000. There are also the Southern Railway's construction and repair shops, two hosiery-mills, engine-works, two cotton-oil mills, two fertilizer manufactories, ice-factory, foundries, sash and door and other wood-working factories, an orphanage, a colored industrial home, two colored colleges, city hospital, water-works, a public library, and large libraries connected with the theological seminary and South Carolina University. There are electric street cars with 15 miles of excellent city and suburban lines, and electric light and power systems. It was taken by Gen. Sherman's army Feb. 17, 1865, and was much injured by fire. Pop. (1880) 10,036; (1890) 15,353; (1900) 21,108.

Columbia: city and railway center; capital of Maury co., Tenn. (for location of county, see map of Tennessee, ref. 7–E); on Duck river; 47 miles S. S. W. of Nashville. It has Jackson College, two female seminaries, large U. S. arsenal, cotton-mills, flouring-mills, grain-elevator, pump-factory, stock-yard, excellent water-works, etc. Pop. (1880) 3,400; (1890) 5,370; (1900) 6,052.

Columbia, British: See British Columbia.

Columbia City: capital of Whitley co., Ind. (for location of county, see map of Indiana, ref. 3–F); on the Pa. and the Wabash R. Rs.; 19 miles W. by N. of Fort Wayne. Pop. (1880) 2,244; (1890) 3,027; (1900) 2,975.

Columbia College (since 1897 *Columbia University*): an institution of learning in the city of New York. It was originally called King's College, and was chartered by George II. Oct. 31, 1754. Moneys had been previously raised for it under acts of the colonial assembly authorizing lotteries for the purpose, of which the first was passed in 1746. It received also a liberal grant of land from Trinity church, and on a portion of this its first building was erected. Its original site was in what was subsequently the block bounded by College Place, Barclay, Church, and Murray Streets. In 1857 the college was removed to the block bounded by Forty-ninth and Fiftieth Streets, Madison and Fourth Avenues. This was deemed from the beginning and throughout as a temporary location, though commodious buildings were erected upon it. In 1892 purchase was made, at a cost of $2,000,000, of a plot of land lying between 116th and 120th Streets, Amsterdam Avenue and the Boulevard, containing about 17½ acres, to which the college was removed in 1897. The occurrence of the public troubles which led to the war of the Revolution seriously interfered with the business of the college, and finally arrested its operations altogether. Early in 1776 the building was converted into a military hospital, and all the students were dispersed. In May, 1784, the college, then named Columbia, was placed under the government of a board which was styled "the regents of the university," and resumed its functions. In 1787 it was placed under trustees of its own. In 1767, a medical faculty was established, which was discontinued in 1813, that the professors might unite themselves with the College of Physicians and Surgeons of New York, then recently organized. In 1860 a partial union between these two institutions was effected, and on July 1, 1891, the College of Physicians and Surgeons became an integral part of Columbia. In 1793 instruction in law was provided by the appointment of James Kent, afterward eminent as chancellor, as professor of law, but a law school in the proper sense was not established till 1858, since which time a flourishing department of law has been maintained. A school of mines was organized in 1864, and has developed into four schools of applied science, viz.: Mines, chemistry, engineering, architecture, all under a faculty of applied science; there are eight distinct courses of scientific study: (1) mining engineering; (2) civil engineering; (3) metallurgy; (4) analytical and applied chemistry; (5) architecture; (6) sanitary engineering; (7) electrical engineering; (8) mechanical engineering. In 1880 there was established a school of political science, at which time also an extensive system of post-graduate instruction was provided for. In 1890 a school of philosophy was organized, and in 1892 a school of pure science. The college has in its seven faculties 375 professors and other officers of instruction, and 4,333 students (1900–1901). In 1883 the libraries of the various schools were concentrated into one general library, which now embraces, exclusive of pamphlets, 310,620 volumes (June, 1901), and increases at the rate of about

20,000 volumes yearly. The cabinets and apparatus of the college for the illustration of the various branches of physical, chemical, and medical science, of geology, mineralogy, natural history, architecture, and mathematics, are excellent and extensive, and are annually increased by gift and purchase. The income of the college from all sources for 1899–1900 was about $800,000. In 1890–91 the college was reorganized on the basis of a university, and its segregated parts made into a homogeneous whole; each school is, as to its specific work, in charge of its own faculty, with a dean at the head, while all university work and the educational interests of the college at large are committed to a university council consisting of the president, the deans of the several schools, and a delegate from each faculty.

The presidents of the college have been Samuel Johnson, D. D. (1754–63); Myles Cooper, S. T. D., LL. D. (1763–75); Rev. Benjamin Moore (*pro tem.* 1775–76); William S. Johnson, LL. D. (1787–1800); Charles H. Wharton, S. T. D. (1801); Rt. Rev. Benjamin Moore, 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., L. H. D., D. C. L., Ph. D. (1864–89); Henry Drisler, LL. D. (acting, 1888–90); Seth Low, LL. D. (1890–). J. H. Van Amringe.

Colum'biad: a seacoast howitzer, of cast iron, proposed by Col. George Bomford, chief of ordnance, U. S. A., and introduced about 1812. Some of these guns were in service during the war between England and the U. S. 1812–15. Three calibers were recommended—50-pounders, 100-pounders, and 150-pounders—for coast defense, particularly against shipping, as a single shell of the larger sizes exploding in a vessel's side, or on her decks, would, it was thought, produce great injury, if not complete wreck.

Meyer's *Technologie des Armes à feu* mentions, under date 1815, "the explosion of an English vessel hit by an American shell before New York"; and again, under the same date, "Very good results were obtained in America from ovoidal (spherico-cylindrical) percussion shells of the caliber of 100, which are fired from a kind of carronade designated by the name of Columbiad." This is the first notice given by this diligent and accurate author of the existence of such a gun, or of a percussion shell, in the world. He seems to have searched thoroughly from the commencement of the Christian Era.

Halleck (*Military Art and Science*, page 280) states (in a note), after designating large howitzers as "*Paixhans guns*," or "*Columbiads*"—"the description of one of Col. Bomford's columbiads which was at Governor's island, New York harbor, was taken to France by a young French officer, and thus fell into the hands of Gen. Paixhans, who immediately introduced them into the French service."

Whether Gen. Paixhans received as above the description of the columbiad or not, there would seem to be no doubt that this gun was the first howitzer of cast iron of like caliber and length that was successfully used for shell-firing. Eight-inch and 10-inch howitzers had been proposed and made at earlier dates—that is, chambered guns shorter than cannon and longer than mortars, and having trunnions in advance of their vents, and near the center of gravity of the gun—but these guns were of bronze, generally shorter than the columbiads, and were not designed or used for shell-firing at low angles, but for heavy projectiles, to obtain great range.

In 1749 France adopted the 8-inch siege howitzer, but suppressed it in 1803 as useless, upon Gassendi's recommendation, retaining only a 5½-inch field howitzer. In 1804 9-inch and 11-inch howitzers, proposed by Villantrois, were made at Douai of eight calibers length, and were fired with lead-filled shells at high angles; and in 1810, at Seville, in Spain, a 10-inch howitzer of seven calibers length was cast to obtain a long range at the siege of Cadiz.

From 1809 to 1819, according to Meyer, Paixhans was interested in experiments to prove the superiority of hollow projectiles over hot shot for naval warfare, and the destructive effects of bursting shells. In 1819 he presented his treatise *Nouvelle Force Maritime*, but not published until 1822, in which he first proposes his *canon-obusier*, an 8-inch howitzer shell gun of cast iron. The English claim that Gen. Millar, who introduced a like gun in 1824, proposed it in 1820.

In the U. S. the 8-inch howitzer and 10-inch howitzer shell guns were remodeled in 1841 and 1844, intending these last, called *columbiads*, to be fired with solid shot and with one-sixth their weight of powder; but subsequently they were reserved for shell-firing only, and a new pattern was adopted in 1858; two of which (one cast solid and one hollow, and as proposed by Gen. Rodman, cooled from the interior) were subjected to comparative proof, both enduring the remarkable number of 4,082 rounds, with solid shot and service charge, without destruction.

In 1861 the Rodman exterior form of guns was adopted for the columbiads, as for all others, and calibers of 13, 15, and 20 inch smooth-bore, 10-inch and 12-inch rifled, and 13 and 15 mortars, adopted for seacoast guns.

Col. Bomford also proposed the 12-inch gun of 1846, and while testing its capabilities carried on a series of experiments proving the best and simplest form of fuse-shells fired from heavy guns, with the safety-caps sufficient to protect the fuse from extinction by ricochet on land or water. Revised by James Mercur.

Columbia, District of: See District of Columbia.

Columbia University: Columbia College (*q. v.*).

Columbian College: See Columbian University.

Columbian Exposition, World's: an international exposition held at Chicago, May 1–Oct. 30, 1893, celebrating the four hundredth anniversary of the discovery of America by Christopher Columbus in 1492.

Organization and Plan.—As this anniversary approached, the fitness of the commemoration of the event by the people of the U. S. by means of a "world's fair" was universally recognized. Washington, New York, St. Louis, and Chicago urged their fitness as sites for the Fair, and Congress, by an act approved Apr. 25, 1890, selected Chicago, recognized the World's Columbian Exposition, an Illinois corporation previously formed, and appointed the World's Columbian Commission, a national commission of delegates, two from each State and Territory, two from the District of Columbia, and eight at large. Later a Board of Lady Managers and a World's Congress Auxiliary were added, and these four bodies managed the fair through their representatives. In direct control of the Exposition were Thomas W. Palmer, president of the National Commission; Harlow N. Higinbotham, president of the local corporation; George R. Davis, director-general; Mrs. Potter Palmer, president of the Women's Board; and C. C. Bonney, president of the Congresses.

The site selected was Jackson Park (533 acres), 6 miles S. of the center of Chicago, and extending for a mile and a half along Lake Michigan, and to this was added the adjoining Midway Plaisance (80 acres), a driveway between Fifty-ninth and Sixtieth Streets, which extended a mile westward and connected with the park system of the city.

The designing and construction of grounds and buildings were in charge of Daniel H. Burnham, chief of construction; John Root, his partner; F. L. Olmsted and Henry Sargent Codman, landscape architects. Mr. Root's death put the brunt of the work upon Mr. Burnham, after the general plans were adopted, and the ill-health of Mr. Olmsted caused him to leave the planning of the landscape work to Mr. Codman, who, however, died in Jan., 1893. The designer-in-chief was Charles B. Atwood, and the sculptor St. Gaudens at first acted as director of sculptures, and afterward unofficially in an advisory capacity. By the advice of Mr. Burnham and his colleagues, the most prominent architects of the U. S. were directly chosen to plan the buildings, separate buildings being assigned to each, but all superintending the general effect. This plan insured unity of purpose with freedom in detail.

Upon the Fair grounds there were in all about 150 different buildings. Of the main ones, that of Manufactures and Liberal Arts (Fig. 1; 787 by 1,687 feet) was built from plans and designs prepared by George B. Post; the Administration Building (Fig. 2; 262 feet square), by Richard M. Hunt; Machinery Hall (Fig. 3; 494 by 842), by Peabody & Stearns; the Agricultural Building (500 by 800), by McKim, Mead & White; Electricity Building (345 by 690), by Van Brunt & Howe; Mining Building (350 by 700), by S. S. Beman; Transportation Building (Fig. 4; 256 by 960), by Adler & Sullivan; Fisheries Building (162 by 361), by Henry Ives Cobb; Horticultural Building (250 by 997), by W. L. B. Jenney; the Fine Arts Building (320 by 500; for cut, see Chicago), by Charles B. Atwood, who also designed the Forestry Building, the Peristyle, Music Hall, and Casino; and the Woman's Building (Fig. 5; 200 by 400) by Miss Sophia G. Hayden, to whom it had been awarded after competition.

The chief engineer of the fair was E. C. Shankland, who designed and built the enormous arches of the largest building.

Full advantage was taken of the site upon the shores of Lake Michigan. Two inlets permitted boats to pass from the lake, one into an interior pond at the southern end of the grounds, and another, a little N. of this, passing beneath an excellently designed bridge and colonnade into a long basin. The open space about the Basin was called the Court of Honor, and in the impressive group of buildings around this was centered the main interest of the fair.

the canal giving admission to the North Pond. The effect of these interior waterways was to rest and refresh the eye, to reflect and double the architectural features along their shores, and to furnish means of agreeable transportation in gondolas, electric launches, and other craft.

The general artistic and popular verdict has declared the fair unrivaled for unity of effect and variety of architectural beauty. "Staff," first used in the Paris Exposition of 1889, proved an ideal material for the construction of the main buildings of the Fair, appropriately called the White City.

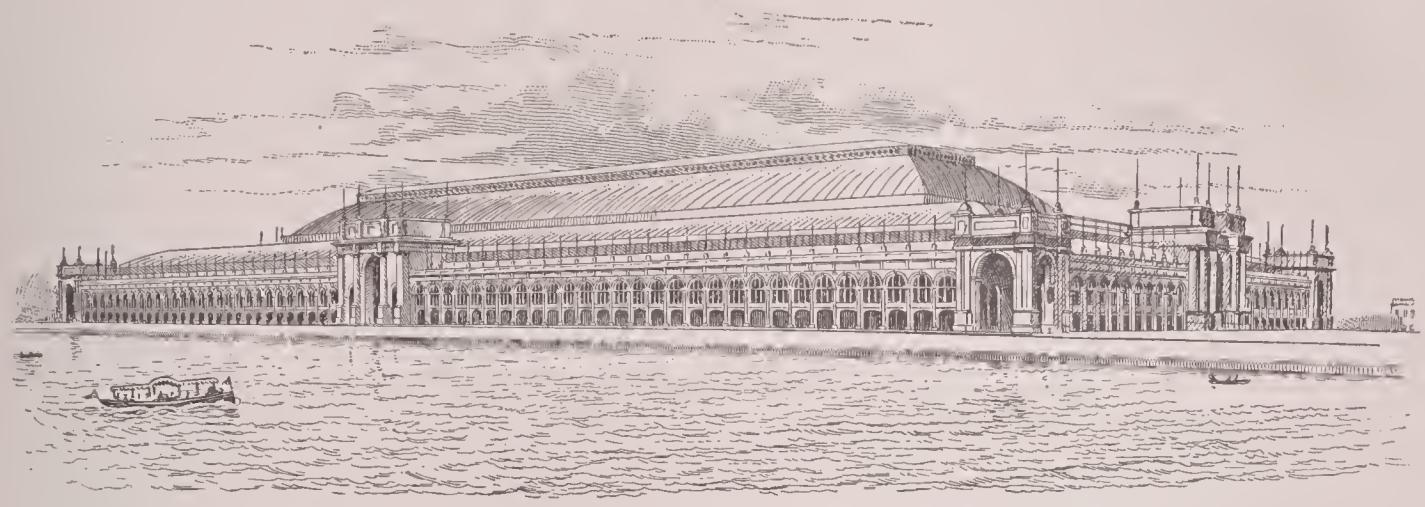


FIG. 1.—Manufactures and Liberal Arts Building.

From the Basin an artificial canal led to the Lagoon, a miniature lake containing a large and a small island, and another canal connected with a northern pond lying in front of the Art Galleries. At the head of the Basin and Court of Honor was the Administration Building, which, opening by four large arched doorways, served as an effective gate to the grounds; still farther westward lay the terminal stations for the railways, flanked by the richly colored Transportation Building. Northward of the Administration Building were the structures devoted to mines and electricity, and southward lay Machinery Hall and its annex. The Basin, having at the west end the fountain of Progress, and at the east end the colossal statue of the Republic, led to the lake

It is light, easily worked, readily takes any form and color, and when painted is exceedingly durable. It is a composition of plaster and jute fiber, but gave at a short distance the effect of marble. From the main group of buildings, dignified in style, the visitor passed gradually through buildings of less severity of design, until he reached on the N. the fantastic Fisheries Building, or on the S. the Forestry Building—the one quaintly decorated with marine forms, and the other consistently rustic in construction. This prepared him for freedom and variety shown in the State and National buildings, or the lofty mound of imitation rock wherein the cliff-dwellers' exhibit was housed. Then in the Midway Plaisance the visitor found a "street of all nations,"

FIG. 2.—Administration Building.

and Peristyle, and was between the Manufactures and Liberal Arts Building and the Agricultural Building. Beyond the Peristyle was a pier 1,200 feet long.

The Lagoon was so nearly filled by the Wooded Island as to be really two waterways, the westerly one extending from in front of the Golden Doorway of the Transportation Building, past the Horticultural Hall with its enormous crystal dome, and ending just beyond the front of the Woman's Building, while the easterly channel led past the Liberal Arts Building and the U. S. Government Building, and, just beyond the west wing of the Fisheries Building, opened into

where a native Javanese village stood between a German town and a Japanese bazaar. The great Ferris Wheel, rising to a height of 264 feet, stood half way down the Plaisance, and dignified its strange surroundings.

Between the north pier, near which was the model of the man-of-war Illinois, and the south pier with its moving sidewalk, the lake shore was dominated by the massive front of the Liberal Arts Building, and formed the best setting possible for frequent displays of fireworks and exhibitions of the life-saving service. Upon a rocky point of land just S. of the south inlet was a model of the Convent of La Ra-

bida, so closely connected with the history of Columbus's first voyage.

During the six months of the Fair special days were set apart for celebrations of the most varied character, including the reception of distinguished visitors, such as the Duke of Veragua, a lineal descendant of Columbus, and the Infanta Eulalia of Spain, the holding of State days for the principal States of the Union, and of national days for foreign nations; there were also concerts by musical organizations, conventions of orders and societies, addresses and congresses, commemorations of anniversaries—an endless array of meetings and *fêtes* and pageants on land and water, by day and by night.

Opening the Fair.—The erection of buildings began in June, 1891, and on Oct. 23, 1892 (corresponding to Oct. 12, old style), the grounds were turned over to the national commission, and the buildings were dedicated by the Vice-President of the U. S. The ceremonies took place in the Manufactures and Liberal Arts Building, in the presence of 130,000 people. A Columbian ode, by Harriet Monroe, was read and there were addresses by officials of the Fair and by Chauncey M. Depew and Henry Watterson, the singing of an anthem, and of a Columbus hymn by J. K. Paine, followed in the evening by fireworks. The Exposition was not formally opened, however, until May 1, 1893. After an address by the director-general, President Cleveland declared the Fair open and set in motion the great Allis engine; at the same moment a salute was fired, the various national flags were unfurled, the electric fountains were turned on, Mr. French's gigantic statue, The Republic, was unveiled, and all present sang *America*, while upon the waterways bells tolled and whistles blew.

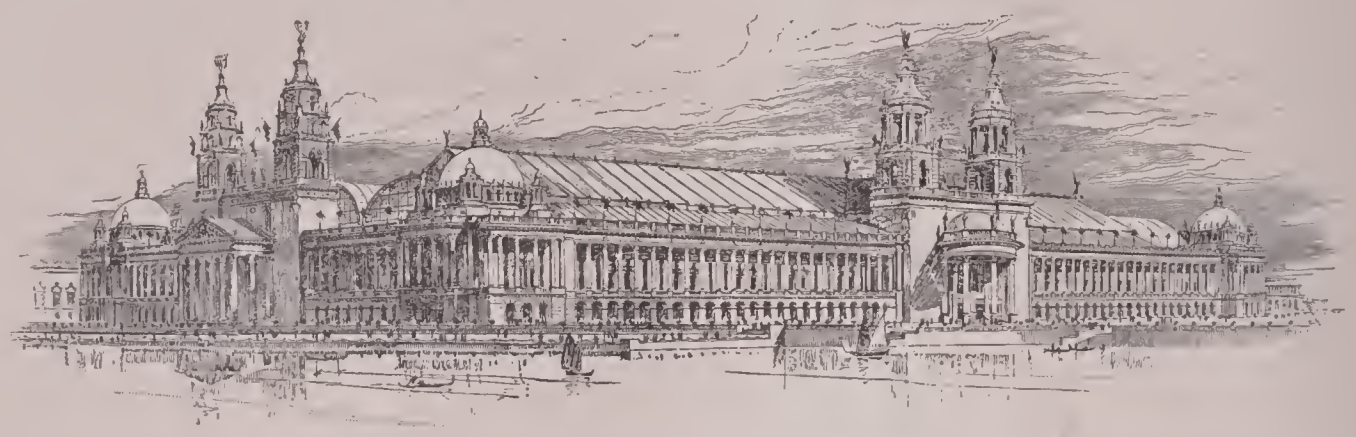


Fig. 3.—Machinery Hall.

Attendance.—The attendance varied greatly, increasing largely in the closing weeks, but averaged for the whole period 172,712 paid admissions daily. The first notable day was July 4, American Independence Day, when there were more in attendance than on any day before Oct. 9; but on that date—Chicago Day—there were gathered the greatest number of people that ever met within that area, 716,881 visitors entering the Fair. The best record of the Paris Exposition of 1889 was not much over half of this number, while the Centennial never exceeded 257,000. The total attendance during the whole Chicago Exposition was over 27,500,000. The principal days and the number of paid admissions on each were: May 1, Opening Day, 128,935; May 30, Decoration Day, 115,578; June 8, Infanta Eulalia Day, 135,281; June 15, Germany's Day, 165,069; June 17, Massachusetts Day, 148,994; July 4, U. S. Day, 283,273; July 20, Sweden's Day, 129,873; Aug. 12, Bohemia's Day, 151,971; Aug. 15, Rajah Rajagan Day, 123,530; Aug. 18, Austria's Day, 123,428; Aug. 19, Great Britain's Day, 168,861; Aug. 24, Illinois Day, 243,951; Aug. 26, Machinery Day, 168,036; Sept. 2, Roman Catholics' Day, 148,560; Sept. 4, New York State Day, 160,382; Sept. 6, Wisconsin Day, 175,409; Sept. 7, Pennsylvania and Brazil Day, 203,460; Sept. 8, Cymrodorian Day, 180,746; Sept. 9, California Day, 231,522; Sept. 11, Kansas Day, 160,128; Sept. 12, Maryland Day, 167,108; Sept. 13, Michigan Day, 160,221; Sept. 14, Ohio Day, 198,770; Sept. 15, Vermont and Costa Rica Day, 157,737; Sept. 16, Texas Day, 202,376; Sept. 19, Fishermen's Day, 174,905; Sept. 20, Iowa Day, 180,552; Sept. 21, Sportsman's Day, 199,174; Sept. 23, Knights of Honor Day, 215,643; Sept. 26, Odd Fellows' Day, 195,210; Sept. 27, Indiana Day, 196,423; Sept. 30, Ireland's Day, 108,885; Oct. 5, Rhode Island Day, 180,404; Oct. 7, Poland's Day, 222,176; Oct. 9, Chicago Day, 716,881; Oct. 10, North Dakota and Firemen's Day, 309,294; Oct. 11, Connecticut Day, 309,277; Oct. 12, Italian and Trainmen's Day, 278,878; Oct. 13, Minnesota Day, 221,607; Oct. 21, New York City Day, 298,928; Oct. 24, Mary Washington Day, 243,178; Oct. 25, Marine Transportation Day, 252,618; Oct. 27, Coal, Grain, and Lumber Dealers' Day, 250,583; Oct. 28, Reunion of Cities Day, 240,732; Oct. 30, Closing Day, 210,622.

Casualties.—In spite of the vast multitudes that came together there was the slightest possible disorder. Ex-Inspector Bonfield, of the Chicago police, by the aid of 300 picked men, effectually kept all lawlessness in check. Of goods to the value of $32,988 reported lost by stealing, $31,875 worth was recovered, and there were only 845 arrests with 400 convictions. The sole serious disaster attending the Exposition was the burning on July 10, 1893, of the cold storage building, a warehouse at the southern end of the grounds. A number of firemen sent into its tower were cut off by the flames and perished. The receipts of the last Sunday upon which the Exposition was kept open were set aside as a benefit fund for the families of these firemen.

Exhibits.—Apart from the grounds and buildings, the most generally sought exhibits were naturally those relating to Columbus. The model of La Rabida was made a museum for the display of portraits, paintings, maps, and relics of all that related to early navigation, and particularly to the great discoverer. There were specimens of Columbus's handwriting, original documents from the Spanish court, including the commission from Ferdinand and Isabella, Columbus's will, and a few of his letters, and the remains of the first town in the New World. Near by were the caravels—facsimiles of the discoverer's three vessels, built by Spain and presented to the U. S.; and the Viking ship—a reproduction of that unearthed at Gokstadt in Norway, built by popular subscription and presented to the U. S. by Norway. It had just been sailed across the ocean by Magnus Andersen.

Fig. 4.—Transportation Building.

The exhibits in the main buildings can receive here but the briefest mention. Sculpture and mural painting were prominent features of the Administration Building; the Transportation Building was noteworthy for a collection of

all methods of carrying passengers and merchandise, from the waxwork human pack-carrier to a complete section of an ocean steamer, palace-car trains of the latest design, and the fastest locomotive in the world; and the Mining, Electricity, Machinery, and Agricultural buildings each contained a complete exposition of the progress and present state of its department of human industry. The Building of Manufactures and Liberal Arts included whatever relates to education, engineering, architecture, publishing, music, and the drama, together with the professions, technical arts and design, and the domestic arts. The enormous roof was reached by elevators running to a height of 220 feet, and from it could be had a fine view of the entire grounds of the fair. The U. S. Government showed in its especial building a complete *résumé* of the work of its departments, including many priceless historical relics. The Fine Arts Building contained loan collections from the U. S. and foreign nations, including scores of masterpieces in painting and sculpture, while the Woman's Building for the first time displayed a collection of woman's work in all departments of activity; a special building was given up to children, and contained a *crèche*, a gymnasium, schools, and a library. The Fisheries and Horticultural buildings were as well equipped as the others, displaying fully all that related to their departments. The State buildings, besides containing reception rooms, were devoted to the history and productions of the respective States, and were, in some cases, reproductions of famous buildings, as Washington's home at Mount Vernon, Va.

The spectacular effects of the Exposition were largely due to the electric lights. At night the great buildings were outlined and illuminated by incandescent and arc lights.

FIG. 5.—The Woman's Building.

Search-lights played along the façades and brought every architectural feature into startling relief, making the great domes like cameos against the dark sky, and sending paths of beamy light to be reflected from the rippling water. The electric fountains danced in changing colors, suggesting enchantment to the most prosaic spectator, and shedding luster upon the white sculptures. Electricity gave light, heat, and power, and brought all parts of the vast grounds within instant communication.

Previous world's fairs had their one novel feature, such as the Eiffel Tower of the Paris Exposition; but the Chicago Exposition had too many characteristic features to allow pre-eminence to any, unless to the harmonious effect of buildings and grounds. There were, however, points of especial interest not yet touched upon that are worthy of comment. The Ferris Wheel was, at least in magnitude, a novel achievement. G. W. G. Ferris, a young engineer, designed and constructed, between Dec. 28, 1892, and June 21, 1893, a tension-spoke wheel 250 feet in diameter, carrying between its two rims 36 coaches, seating 60 persons each. The wheel was driven by gear teeth along its periphery. It ran perfectly from its first revolution until the end of the Exposition, and besides being an engineering success proved popular and immensely profitable. Noteworthy among other features of the Midway Plaisance were Lady Aberdeen's Irish village, the Hagenbeck animal show, the Javanese village, the street in Cairo—a collection of bazaars, donkey-boys, camel-drivers, and a reproduction of the appropriate buildings, the Samoan and Dahomey villages, with exhibitions of native rites and ceremonies, Old Vienna, and the German mediæval museum. Summed up, the Midway Plaisance was an informal and amusing medley of ethnology and miscellaneous catchpenny shows.

Closing the Fair.—The assassination of Carter Harrison, mayor of Chicago, on Oct. 28 caused the abandonment of an elaborate programme arranged for the closing day, and instead the exposition was only formally declared closed and the flags lowered on Oct. 30. The work of dismantling began next day. There seemed to be a strong desire to set fire to the empty buildings, and on Jan. 8, 1894, the Liberal Arts Building and Peristyle were burned. On Feb. 10, 1894, four incendiary fires occurred, but did comparatively little damage. The attempt was renewed in March, and on July 5, during the great railway riots at Chicago, unknown incendiaries succeeded in burning six of the largest buildings.

Field Museum.—The Fine Arts Building is to be preserved as a permanent museum, containing many of the exhibits of the Fair. The Field Columbian Museum has been incorporated, being endowed by Marshall Field, L. Z. Leiter, George M. Pullman, and others, thoroughly equipped with an efficient staff of officers, and beginning with a collection of an estimated value of $2,000,000. A central rotunda contains models of the chief sculptures of the Fair.

Financial.—The act of Congress giving the Fair to Chicago required the city to raise $10,000,000. One-half of this amount had already been pledged, and Chicago issued bonds for the other $5,000,000. Afterward a loan of Federal credit was applied for, and Congress responded by the gift of a special mintage of $2,500,000 in souvenir half-dollars, of which over $500,000 was retained by a subsequent act to provide compensation for the juries of award. The Exposition authorities then issued $5,000,000 of debenture bonds, payable Jan. 1, 1894, of which nearly all were sold. To these funds were added, from interest and miscellaneous sources, including floating liabilities, some $3,000,000 more, making in all about $20,000,000 expended by the opening day. Subsequently $5,500,000 more was expended out of gate receipts, increasing the total cost of the Exposition proper to $25,500,000. The U. S. Government appropriated to its exhibits $2,250,000; foreign governments, $6,000,000; the States, $7,000,000; and the Midway concessionaries invested in their enterprises about $350,000. Thus the grand total cost of the Fair exceeded $40,000,000. The following is a condensed balance-sheet of the receipts and expenditures:

Gate receipts		$10,626,330 76
Concession receipts		3,699,581 43
Miscellaneous receipts		686,070 49
Interest		86,981 82
Souvenir coins and premium		2,448,032 28
Capital stock		5,604,171 97
City of Chicago		5,000,000 00
Total		$28,151,168 75
Construction expenditures		$18,322,622 56
General and operating expenses		7,127,240 32
Preliminary organization		90,674 97
Assets	$2,698,291 01	
Liabilities	87,660 11	
Net assets		2,610,630 90
Total		$28,151,168 75

From the net assets must be deducted the sum of $748,147, representing all outstanding debts and obligations. On Oct. 9, Chicago Day, by a check of over $1,000,000 the treasurer of the Exposition discharged its final indebtedness by redeeming the debenture bonds with interest. The profit on the Fair was about $1,850,000.

Sunday Closing.—The souvenir-coin gift from Congress required that the Fair should be closed on Sunday, and on

the first Sunday the Fair was closed. After some controversy between the national commission and the local directory, the Fair was opened on Sunday, May 28, but closed again on July 23, contrary to an injunction that had been granted May 14 by Judge Stein, who fined the director-general $250 and five directors $1,000 apiece for contempt of court. An appeal was taken, but remained undetermined until the Fair closed, the gates remaining open on every Sunday thereafter. The attendance on Sunday, however, was much smaller than on other days, and many exhibits were closed.

Awards.—The awards were made according to a fixed standard of excellence, and not in competition, and bore the smallest proportion to exhibits in the history of similar expositions.

World's Congresses.—During the Exposition conventions were held under the auspices of the World's Congress Auxiliary, wherein were discussed philosophical, intellectual, religious, and economic problems from an international standpoint. Among the results was a memorial in favor of international arbitration signed by the commissioners of forty nations and presented to the President of the U. S. and the Secretary of State. Of these gatherings the World's Parliament of Religions attracted the most attention, conventions of religious bodies being held from Aug. 27 until Oct. 15.

History.—The preparation of the official history was intrusted to a committee consisting of Harlow N. Higinbotham, Lyman J. Gage, and Edwin Walker, who chose D. Appleton and Co. as the publishers and Rossiter Johnson as the editor. It is in four royal octavo volumes, beautifully illustrated, and differs from all other histories of expositions in that it is not a verbatim printing of official reports, but a readable narrative with such reports and other matter for its basis.

Columbian University: an institution of learning, situated in Washington, D. C.; founded mainly by members of the Baptist denomination, but unsectarian in its administration. It was incorporated by act of Congress in 1821 under the name of Columbian College, which name was changed to Columbian University by an act of Congress, approved Mar. 3, 1873. In 1883 a new and stately university building was erected in the heart of Washington, and in 1884 a new department of instruction was added to its system, called the Corcoran Scientific School in honor of W. W. Corcoran, the great benefactor of the university and the founder of its largest endowment. In 1892 a school of graduate studies was erected as a part of its university system. In 1899–1900 its faculty comprised 173 teachers, and the number of its students in all schools was 1,041. James C. Welling.

Colum'bidæ [from *Columba*, the typical genus]: a family of birds containing the true pigeons and doves, of the order Columbæ (*q. v.*). See also Pigeon.

Col'umbine: a perennial plant of the genus *Aquilegia* and family *Ranunculaceæ*. Columbines have five petals, all alike, with a short spreading lip, produced backward into large hollow spurs, much longer than the calyx; pistils five. The *Aquilegia vulgaris*, or common columbine, a native of Europe, is cultivated in gardens for its showy flowers. The *Aquilegia canadensis*, a native of the U. S., has beautiful scarlet flowers of curious structure. Several pretty species grow in the Rocky Mountains.

Revised by Charles E. Bessey.

Colum'bium, or **Nio'bium**: a rare metal originally discovered in columbite from Massachusetts by Hatchett in 1801. Wollaston in 1809, in investigating minerals containing columbium, expressed the belief that the metal was identical with tantalum, and this view was generally accepted until 1846, when H. Rose showed that the two were distinct, though tantalum occurs in many of the columbium minerals. Rose, indeed, inclined to the belief that what had been described as columbium really consisted of two metals, which he called niobium and pelopium. Further investigations showed him that but one metal was the basis of the supposed two; so the name pelopium was dropped and the name niobium was retained, the symbol Nb being now used for columbium. The black powder produced by heating columbium compounds with sodium has been supposed to be the metal, but Delafontaine states that this powder is the protoxide, and that the metal is a steel-gray powder obtained by igniting the chloride $NbCl_5$ in a current of hydrogen. With tantalum, columbium forms a group distinct from the other elements. The principal minerals in which columbium is found are columbite, a columbate of iron and manganese; bragite, a columbate of yttrium and iron; samarskite, a urano-columbate of yttrium and iron; pyrochlore, a columbate of lime, cerium, etc.; æschynite, a titano-columbate of cerium, iron, lanthanum, etc. Some of these minerals contain tungsten. They are found in small quantities in a few localities in Europe and the U. S. The atomic weight of columbium is 94. Revised by Ira Remsen.

Columbo: See Colombo Root.

Columbus: city; capital of Muscogee co., Ga. (for location of county, see map of Georgia, ref. 5–F); on Cent. of Ga., Col. So., Ga. Mid. and G., and So. West. R. Rs., and on the east bank of the Chattahoochee river, which here forms the boundary between Georgia and Alabama. It is 100 miles W. S. W. of Macon and 292 by railroad W. of Savannah. Steamboats ply at all seasons between Columbus and Appalachicola, Fla., light draughts only being used in summer. It has six cotton-factories, and the falls of the river at this point afford a water-power sufficient for 100,000 spindles. It has machine-shops and foundry, besides planing and flouring mills. The public schools for white and colored are unsurpassed by any in the State. The suburbs of Columbus are noted for the beauty of their scenery and the taste of their private residences. Pop. (1880) 10,123; (1890) 17,303; (1900) 17,614. Editor of "Enquirer-Sun."

Columbus: city; capital of Bartholomew co., Ind. (for location of county, see map of Indiana, ref. 8–E); on the Pittsb., Cin., Ch. and St. L. and the Cl., Cin., Ch. and St. L. R. Rs., and on East Fork of White river; 41 miles S. S. E. of Indianapolis. The principal industries of Columbus are manufactures of cerealine, starch, flour, agricultural implements, furniture, etc. The city has complete systems of water-works, street railways, and electric lights, and contains handsome public buildings and churches. Pop. (1890) 6,719; (1900) 8,130. Editor of "Republican."

Columbus: city; capital of Cherokee co., Kan. (for location of county, see map of Kansas, ref. 8–K); on Kan. C., Ft. S. and M., and St. Louis and San Fr. R. Rs.; 50 miles S. of Fort Scott. It is an agricultural district; coal, iron, and zinc are mined in the vicinity. Pop. (1880) 1,164; (1890) 2,160; (1900) 2,310.

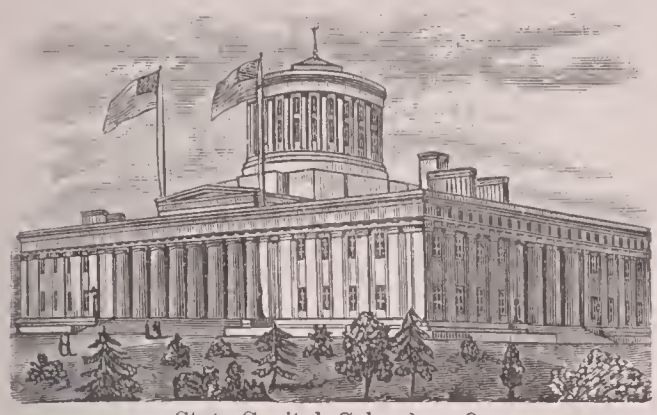
Columbus: a city of Hickman co., Ky. (for location of county, see map of Kentucky, ref. 5–B); on the Mississippi river; 196 miles by rail below St. Louis; the northern terminus of the Mobile and Ohio, and the St. Louis, I. M. and S. R. Rs. Pop. (1880) 1,338; (1890) 873; (1900) 1,235.

Columbus: city; capital of Lowndes co., Miss. (for location of county, see map of Mississippi, ref. 5–H); on Ga. Pac. and Mob. and Ohio R. Rs., and on the (navigable) Tombigbee river; 123 miles from Birmingham, Ala.; in the center of an iron and coal mining region. The city has many fine churches, very good public schools, State industrial institute and college for the education of white girls in the arts, sciences, and trades; cotton-mills (employing 300 operatives), wagon-factory, three machine-shops, oil-mill, and grist, lumber, and shingle mills. Pop. (1880) 3,955; (1890) 4,559; (1900) 6,484. Editor of "Dispatch."

Columbus: a city; capital of Platte co., Neb. (for location of county, see map of Nebraska, ref. 6–J); on the Platte and Loup rivers and the Union Pacific and Burlington and Missouri R. Rs.; 92 miles W. of Omaha. It has bridges across the Platte and Loup, a high school, a Roman Catholic academy, and various industries. Pop. (1880) 2,131; (1890) 3,134; (1900) 3,522. Editor of "Telegram."

Columbus: city; capital of the State of Ohio and of Franklin County (for location of county, see map of Ohio, ref. 5–E). It ranks third among the cities of the State in population, manufactures, and wealth. It is situated within less than 25 miles of the geographical center of the State, in lat. 39° 57′ and lon. 83° 3′ W. Its finest public building is the State-house, a noble structure 304 feet long by 134 feet wide, covering 55,936 sq. feet. An annex nearly half as large as the original building, which it adjoins, has been completed recently. Ohio is noteworthy for her benevolent institutions, and those for the blind, the deaf and dumb, the feeble-minded, and the Central Ohio Hospital for Insane are located at Columbus, all having very large and attractive buildings, that for the insane being a mile around the outer walls. The U. S. Government has a fine building for the post-office and U. S. court; and the Franklin County court-house is excelled by but few in beauty of architecture and completeness of finish. The State Board of Agriculture has

large fair-grounds adjoining the city, handsomely improved with fine buildings and landscape designs. The Ohio peni-



State Capitol, Columbus, O.

tentiary has 3,052 cells, and shop-room enough for all the inmates to work.

Churches and Benevolent Societies.—There are 103 Protestant and 19 Catholic churches in the city. The former are occupied by 15 different denominations, and many of the recent structures are very handsome. There are 50 organizations classed as "benevolent" societies (not secret), and among them several of long standing and great usefulness, and some of them well endowed.

Schools.—There are 4 high schools and 33 other public schools, which in 1900 were valued, including furniture and libraries, at $2,450,000. They have a seating capacity of 20,000, and the enrollment of pupils in 1900 was about 18,381. The Roman Catholics have 9 parochial schools, 2 academies, 1 convent, and 1 papal college. The Columbus Art School is a well-equipped and prosperous institution.

Colleges.—The Ohio State University has (1901) 106 professors and instructors and 1,450 students, with the following buildings: University Hall, Chemical Hall, Mechanical Hall, Electric Hall, Botanical Hall, Hayes Hall (manual training), Orton Hall (geology and library), Veterinary Building, Townshend Hall (college of agriculture), Biological Hall, Armory and Gymnasium, power-house, boiler-house, Emerson McMillin Observatory, Horticultural Hall, 2 dormitories, and a farm of 345¼ acres. The estimated value of land and buildings is $2,300,000. The cost of equipment and apparatus, $200,000; total endowment, $553,893.62. The total expenses for the year 1900 were $308,491.34. The library contains 35,000 volumes. A law school forms a part of the university, and had in 1900 5 professors, 3 lecturers, and 250 students. Capitol University (Lutheran) is a well-equipped college. Starling Medical College is an old and well-established school, with an attractive building and a valuable museum, and a well-fitted chemical laboratory. Ohio Medical University has a large and well-arranged and fully equipped building. The Ohio State University is in part supported by a State levy, which yields annually $180,000.

Libraries.—The State Library has 71,293 volumes; the Law Library (State) 20,570 volumes; the Public Library 31,357 volumes; the Public School Library 47,248 volumes.

Newspapers.—There are 4 daily and 1 weekly newspapers.

Banks.—There are 6 national and 12 private banks, with a capital of $3,600,000, surplus $601,900. The clearings at the clearing-house in 1900 were $269,269,000.

Manufactures.—The census of 1900 shows 407 manufactories, with a capital of $13,438,358; average number of hands employed, 10,776; wages paid during the year, $5,445,032; value of products, $8,347,678. Among the factories are 16 for carriages and wagons, which turn out more vehicles than are manufactured in any other place.

The Water-works.—Water-works are constructed on the Holly system, with 200 miles of pipe laid, and pumped in 1900 an average of 24,000,000 gal. daily.

There are 105 miles of gas mains laid, besides which a large part of the city is supplied with natural gas.

Thirteen standard-gauge railroads use the Union Depot, and a little more than an average of 120 passenger trains enter daily. The two divisions of the Ohio Central lines and the Columbus and Lima Northern use the Ohio Central Depot, making the entire number of standard-gauge railroads entering the city 16. Besides these, a dozen interurban electric railways are in operation and under construction, connecting all the surrounding county seats with the capital. There are 98 miles of electric street railway in operation. There are 116.73 miles of well-paved streets, 17.319 miles asphalt; 9.482 stone block, 75.116 brick, 9.196 boulders, 5.620 macadam; and all the streets well lighted by electricity.

The total valuation of taxable property in 1900 was $66,847,000, or $532 per capita; and the city debt was $5,155,500.

Railroads.—Columbus has railroad lines leading to all parts of the State and country, among which are four of the great trunk lines—the Norfolk and Western, the Baltimore and Ohio, the Pennsylvania lines, and the "Big Four."

History.—The town was laid out in 1812, and was adopted as the location for the permanent capital of the State: the first sale of lots occurred June 18, with no resident in the city. Owing to its healthful situation, its pure water-supply, and its thorough sanitary regulations, the city death-rate is as low as 13·73 per 1,000 inhabitants. The population in 1850 had reached only 17,882. That for the succeeding decades was (1860) 18,554; (1870) 31,274; (1880) 51,647; (1890) 88,150; (1900) 125,560.

EDITOR OF "OHIO STATE JOURNAL."

Columbus: city; capital of Colorado co., Tex. (for location of county, see map of Texas, ref. 5–I); on So. Pac. R. R. and the west bank of the Colorado river. It is the seat of Colorado College, and is a cotton-shipping point. Pop. (1880) 1,959; (1890) 2,199; (1900) 1,824.

Columbus: city; Columbia co., Wis. (for location of county, see map of Wisconsin, ref. 6–D); on Ch., Mil. and St. P. R. R. and on Crawfish river; in an agricultural district. Pop. (1880) 1,876; (1890) 1,977; (1900) 2,349.

Columbus: BARTHOLOMEW (in Spanish, BARTOLOMEO COLON): brother of Christopher Columbus; born probably at Genoa about 1445. He seems to have preceded his brother to Portugal, and in 1486–87 he was with the expedition of Bartolomeo Diaz which explored the west coast of Africa to the Cape of Good Hope. In 1488 he went to England to interest Henry VII. in his brother's project. The common story is that Henry was finally induced to undertake the business when it was too late. On his return through France Bartholomew heard of the admiral's arrival from his first voyage. Reaching Spain after his brother had sailed on the second voyage, he was given command of a supply fleet for Hispaniola, and arrived there in June, 1493. On the admiral's return from the exploration of Cuba he made Bartholomew his lieutenant or *adelantado*, an appointment which at first displeased Ferdinand, but was afterward confirmed. In the history of the island during the next seven years he took a prominent part, governing during the absence of the admiral, 1496–98, founding San Domingo 1496, subduing the Indians and marching to Xaragua in 1497. (See the following article.) Carried a prisoner to Spain when the admiral was (1500), he was released at the same time, followed his brother in the fourth voyage, led a land expedition in Veragua, and commanded in the fight with Porras at Jamaica. After the admiral's death he appears to have been in Rome. In 1509 he accompanied Diego Columbus to Hispaniola as chief *alguazil*, and was given the government of the island of Mona for life, with the superintendence of mines and other lucrative offices. D. in San Domingo in May, 1515. He was never married.

HERBERT H. SMITH.

Columbus, Don CHRISTOPHER: a Genoese navigator, the discoverer of America. On account of contradictory statements in the early authorities, it is impossible to determine with confidence either the time or the place of his birth. It is probable, however, that he was born at Genoa about the year 1446. His father, Dominico, was a wool-comber by trade, and the son Christopher was trained in this vocation, though early in life he manifested a taste for other pursuits. His education, though neither comprehensive nor exact, was sufficient to give him considerable knowledge of geography and some facility in the use of Latin. The report that he was at one time a student at the University of Pavia, which appears to have originated some years after his death, must be rejected as apocryphal. Genoa was an important port, and at the age of fourteen the youthful Christopher yielded to the temptations of the sea. The order of events in his life between 1460 and 1484 it is impossible to fix with any measure of confidence. The dates of the more important, however, may be determined with some precision. It was at some time between 1470 and 1473 that he left Genoa and established his home at Lisbon, the capital of Portugal, where his brother Bartholomew had set up a business as a maker and seller of maps. In this vocation Christopher also acquired considerable skill, and as Lisbon was at that period the seat of the most active maritime interests

of Portugal, he had every encouragement to increase his knowledge of geography and of navigation. His tastes in these directions received a great impulse in the year 1474 by some letters from the distinguished Italian geographer Toscanelli. This correspondence makes it evident that Columbus had already conceived the idea of reaching the East Indies by sailing westward. Toscanelli assured him not only that such a voyage was practicable, but also that the size of the earth was such that he could reach Cipango and Cathay (Japan and China) by sailing westward about 3,000 miles. There is positive proof that from the writings of John de Mandeville, of Ptolemy, and especially of Cardinal d'Ailly, Columbus at this time had acquired a confident belief in the sphericity of the earth. He believed that it could be circumnavigated, and for some years before 1484 he directed all his energy and tact to the work of convincing the King of Portugal that Portuguese interests would be subserved by attempting a westward course instead of persevering in the effort to discover a passage by way of Southern Africa. In these efforts he was not successful. But during this period of waiting he had many experiences that encouraged his belief and re-enforced his zeal. In 1477 he sailed to the far north, and came to an island which was probably Iceland. Here he may have learned of the discovery of America nearly 500 years before by the Norsemen. The matter, however, is conjecture, as Columbus nowhere in all the writings of his that have been preserved alludes to any such information or report. During the same period the navigator went upon a slave-trading expedition to Guinea, and served on several piratical expeditions under the much-dreaded corsair Casseneuve. Not long after 1473 he married Felipa Moñiz, of whom very little is known. There is conflicting evidence as to whether his wife died before he left Portugal in 1484, for one authority says that Columbus abandoned the country because of grief at the death of his wife, while the navigator himself, in a letter to the Spanish court at a later period, says that in order to enter the Spanish service he "abandoned wife and children, whom he never again saw." If Columbus was correct in this statement, he had at least three children when he left Portugal, for he took his son Diego with him on going into Spain. All efforts to acquire further information in regard to the wife and younger children have been fruitless.

Columbus entered Spain in the autumn of 1484 or the spring of 1485. Before leaving Portugal he had sent his brother Bartholomew to England with instructions, in case of failure to interest the English court in his new project, to go to France on the same errand. He at once set about the task of persuading the monarchs Ferdinand and Isabella to render him the assistance that had been denied by the King of Portugal. But he was destined to a long period of waiting and to many bitter disappointments. The time was not propitious. Spain was not yet a consolidated monarchy. The resources of the various provinces had been depleted by numerous wars. For the extirpation of heresy the Inquisition had recently been established, and it was still a problem whether this terrible engine of persecution was to be successful. The plague was sweeping off the people in some of the most populous parts of Aragon and Castile, and, worst of all, the sanguinary contest with the Moors had made such drafts upon the treasuries that the coin had been debased, and had so exhausted the resources of the people that no other project could receive a favorable hearing. It is not singular that under these circumstances the monarchs were slow to render the coveted assistance. But they were not inclined to answer him sharply in the negative. From the first they seemed disposed to give to his cause a respectful hearing. Whether this was because of a generous sympathy with his enterprise, or whether it was merely to prevent another court from getting the credit of such discoveries as might be made, is a question that must probably forever be very largely a matter of conjecture. The course pursued, however, was not an unnatural one. The project was again and again referred to a commission consisting of the learned men in the vicinity of the court. The decisions, though never quite unanimous, were uniformly unfavorable. Columbus pleaded his cause eloquently, and he had a few firm supporters and ardent followers. But the vicissitudes of war made the court migratory, and consequently it was never possible to give to the subject the careful and protracted consideration at any one time that was necessary to bring it to a final decision. At length, however, when the banner of the cross was planted on the last Moorish citadel at Granada, the monarchs had no longer any good reason for postponing a final decision. But notwithstanding this fact the slowness of the monarchs discouraged the suppliant. On the very eve of success he decided to abandon the court and betake himself to France for aid. The money with which from time to time he had been supplied by the royal treasurer was exhausted, and he was obliged, on his way to the port, to travel on foot as a mendicant. In this plight he presented himself with his little son at the door of the monastery La Rabida, and begged for a crust of bread. The abbot Parez de Marchena listened to the story with great interest, for he had himself at one time been the confessor of the queen. He believed that he might have influence with the court. It was soon arranged that he should set out at once on a mission of persuasion to Queen Isabella. The journey required several days, but in the end it was successful. The monarchs ordered a sufficient sum of money to be sent to enable Columbus to present himself at court in a respectable manner. He appeared, and Ferdinand and Isabella at length decided that they would render the needed assistance. But the terms demanded by Columbus threatened to defeat the whole project. He asked to be made admiral of the ocean and viceroy of all the territory he might discover; that he should have a tenth of all the gold and other wealth that might in any way be acquired; that he should have sole right to nominate judges and other subordinate officers; and that all his rights and titles should be hereditary. The monarchs very naturally regarded these terms as inadmissible, and Columbus, rather than abate any part of his claim, decided to withdraw. He left the court at Santa Fé, but the enthusiasm of the queen, re-enforced by the persuasive words of the Duchess de Moya and the minister Santangel, was finally successful. Columbus was at once brought back, and it was soon agreed that three vessels should be fitted out at the port of Palos for the expedition. Though the articles were signed on Apr. 17, 1492, the expedition was not ready to sail before the summer was well advanced.

First Voyage.—The difficulties and delays in fitting out the first fleet were owing to a number of untoward causes. For some misdemeanor the people of Palos had been condemned to furnish the Government gratuitously with three vessels and all necessary equipments. But as soon as the nature of the contemplated expedition became known, the imaginations of the populace began to conjure up all conceivable horrors. It seemed to be impossible to enlist a crew. Finally it was proclaimed that a pardon would be issued to debtors and criminals in case they would enlist. Many availed themselves of the privilege thus offered and then deserted. It was many weeks before the necessary men, about 120 in number, could be secured. Of the ships, the Santa Maria, the Niña, and the Pinta, the first, which was the largest, was only about 75 feet in length, and about 100 tons burden. The character of the crew increased the difficulties of the expedition. The fleet, after the crew had all confessed themselves and secured absolution, set sail at sunrise on Friday, Aug. 3, 1492. But the rudder of the Pinta soon needed repairs, and the fleet was delayed more than a month at one of the Canary islands. Setting out again on Sept. 6 the little expedition once more set its sail for the unknown. Fertile imaginations have done much to crowd this famous voyage with perilous experiences. But Columbus's journal, published early in this century, shows that it was not remarkable for incident. There is no evidence that the crew mutinied, or that Columbus's life was at any moment in danger. During most of the passage the prows of the vessels were turned due west. Early in October there began to be increasing indications of land. Loose seaweed and bits of floating wood gave unmistakable intimations that land was not far away. Flocks of birds flying to the S. W. finally led Columbus to turn his course a little to the S. of W., a change which prevented the first landing from taking place on the coast of Florida. At ten o'clock on the evening of Oct. 11 Columbus thought he saw a light. If he was correct in his conjecture, the light was in a boat, for they were running at the rate of about 10 miles an hour, and it was two o'clock on the morning of the 12th when land was first seen. Sails were shortened and the ships drifted before a strong east wind until daylight. There has been much conjecture as to the exact spot where the first landing occurred, but recent studies have led to the belief that the landfall was on Watling's island, and that the exact spot was near Riding Rocks, a little N. of the middle of the west coast. The conjecture of Rudolf Cronau, who explored the islands in 1890, is that the fleet was car-

ried beyond Watling's island by the strong easterly wind and sea in the course of the night, and that on the morning of the 12th it turned about and landed on the lee shore. This theory enables us to reconcile the present appearance of the island with the account given by Columbus.

After a short delay at Watling's, the fleet explored several of the adjacent islands. The most important of these was Cuba, along the northern coast of which Columbus sailed 200 or 300 miles. Retracing his course, he turned to the S. E., where, after exploring several smaller islands, he determined to effect a landing upon the north coast of a large island which he called Hispaniola. The landing was made on Christmas Day, and in commemoration of the fact he called the place La Navidad. The natives on all the islands showed a spirit of friendliness, everywhere regarding the newcomers as visitors from heaven. Remarkable evidence of this spirit was shown when one of the admiral's vessels was wrecked, and the natives, as Columbus says, "came to the assistance of the Spaniards with tears in their eyes," and begged them to accept of "as many of their houses as would be necessary for storage." Here he decided to establish the first settlement. Leaving about forty of his crew with abundant supplies, he turned the two remaining ships homeward, where, at the end of a very stormy passage, he arrived Mar. 15, 1493.

The report of his expedition was received with astonishment and joy. The king and queen at once summoned him for a reception at court. His passage through Spain was a triumphal procession. He had brought a few Indians as captives, and these, with such trappings as he could put upon them, he displayed as evidence of his success. He reported that the islands he had found were off the coast of Asia, and that the untold wealth of Cipango and Cathay would be the reward of further explorations. Ferdinand and Isabella were so much pleased with his reports and assurances that they confirmed him in all his rights and titles, and at once authorized the equipment of a new and a larger fleet.

Second Voyage.—Columbus's second fleet consisted of seventeen vessels. The crew and company were made up of adventurers of every kind. The reports that had been circulated concerning the gold to be found drew into this peculiar service every species of the indolent, the needy, and the avaricious. The voyage, begun on Sept. 25, 1493, was without important incident, except that the navigator passed nearly a month in exploring the small islands S. E. of Porto Rico and observing the customs of the inhabitants, whom he found to be cannibals. On Nov. 27 the fleet reached La Navidad, only to find that every one of the colonists had perished. Investigation made it plain that internal dissensions had been followed by open hostilities, and that disintegration of authority, succeeded by lawlessness in dealing with the natives, had provoked a systematic attack which had ended only with the death of all the settlers.

After due contemplation of this sad spectacle, Columbus determined to seek another site for the establishment of a more permanent settlement. The spot selected was about 10 leagues E. of La Navidad, where nature had furnished many facilities for a fortified camp. Here he planted the first European city in America, and gave it the name of the Spanish queen, Isabella. But the colony was made up of men ill adapted to the work of building a fortified city. To many of them hard manual labor was intolerable. Food was poor, and soon became scarce. Maladies peculiar to a new country broke out with violence. The ravages of disease threw over the whole enterprise the appearance of gloom. Columbus himself was ill at one time for several weeks, and a little later for several months. He had hoped to send back glowing accounts of what had been accomplished by the colony at La Navidad, but, in fact, he was now able to do no more than give a gloomy report of death and disappointment and suffering. In this disheartening state of affairs he determined to fit out two expeditions in search of gold, one of which was to penetrate the island to the S., the other to the E. Neither had much success, though both heard glowing reports from the hospitable natives of the gold that was to be found at a distance. In consequence of these favorable reports Columbus determined to send back twelve of the ships with the news. He also made certain important recommendations. Besides informing the monarchs of the more pressing wants of the explorers, he recommended the formal establishment of the slave-trade as a means of furnishing the colonists with needed supplies and the Government with ample remuneration. He proposed that a fleet of ships should be fitted out to carry cattle from Spain to the islands, and Indian slaves from the islands to Spain. The plan was not approved by Ferdinand and Isabella, but their disapproval was not so pronounced as to dismiss the subject from the mind of the admiral. He resolved to take advantage of the doubt, and sent back five shiploads of slaves. The methods of the explorers soon turned the friendly hospitality of the natives into deadly enmity. It became evident that the island would have to be subdued. The most formidable of the chiefs was captured by treachery, and the ill-organized natives were defeated in a pitched battle.

As a means of replenishing his empty treasury, Columbus now decided to impose tribute of gold upon the natives. Every adult was required to produce a hawk's bell full of gold once in three months, on penalty of manual labor on the farms of the Spaniards. As the requisite gold could not be found, a system of serfage ensued, and the way was rapidly prepared for a succession of disastrous revolts. The natives determined to get rid of their enemies by destroying the crops, and thus bringing on starvation. This, however, did not succeed, for the Indians suffered no less than the invaders. Columbus saw that no favorable report could be made in regard to Hispaniola, and accordingly, in Apr., 1494, he determined to leave the colony for a time in the hands of his brother, Diego, and explore the unknown lands at the west.

But here no better fortune awaited him. For several weeks he skirted along the coasts of Cuba, in the confident belief that he was nearing the city of Cathay, with all its golden treasures. On June 12, however, the crew would go no farther, and he was obliged to turn back. Before doing so he caused eighty of the men to swear that they had reached the continent, and that it would be possible to return to Spain by a continuous journey to the W. by land. Any one who should on his return renounce his oath was to be fined 10,000 maravedis and have his tongue cut out.

On the return of this fruitless expedition to Hispaniola it was found that affairs had in no way improved. Bartholomew Columbus had arrived, and now the admiral placed him second in command. But discontent verging upon insurgency presented a problem even more difficult than that presented by the natives. Two of the most influential of the malcontents, Margarite and Boyle, had taken advantage of Columbus's absence and had sailed for home. They not only gave a doleful picture of the colony to the Spanish court, but they charged the admiral with cruelty and deceit. They asserted that no gold of any amount had been discovered, that the most intolerable cruelties were practiced upon the Spaniards as well as upon the natives, and that all reports from the islands of a favorable nature were misleading and false. The Government decided that these reports justified an official inquiry. The monarchs appointed Don Juan Aguado to make the inquiry; he was a friend of Columbus, who had come out with him on the second voyage and returned to Spain with letters from the admiral. He arrived at Hispaniola in October of 1495. Columbus saw at once from the comprehensive commission of the agent that his position was in imminent peril. He soon decided to present his cause in person to the king and queen. After due preparation he took ship, and after an absence of two years and eight months reached the bay of Cadiz on June 11, 1496.

Third Voyage.—The sovereigns not only manifested a friendly spirit to Columbus, but they even gave exceptional evidence of their approval. They renewed his commissions, and confirmed his brother's appointment as *adelantado*. Best of all, they granted his request to fit out a new fleet of eight ships for a third voyage. But these favors did not conceal or obscure the general disappointment. The friends of those who had manned the second expedition had been made too well aware of the extent of the sufferings and the barrenness of the results. It was not singular therefore that it was now difficult to recruit a crew. Volunteers were few; and at length, after long delays, the admiral obtained the privilege of transporting all criminals to the Indies to serve for a term of years. This unfortunate provision, while it did something to enable the commander to fill up his crew, put a stamp of ignominy upon all service in the colony, and exerted a blighting influence upon all colonial life. The numerous difficulties in the way of preparation occasioned the most annoying delays, and it was not until May 30, 1498, that the expedition was ready to sail. A southerly course was taken for the purpose of reaching and crossing the

equator, but the heat was so great that the plan was abandoned. Turning to the W. the admiral discovered the three mountains which he called Trinidad, and a few days later the lowlands of the continent about the mouth of the Orinoco. This discovery, Aug. 1, 1498, was the first sight the Spaniards obtained of the mainland. Passing through the rush of waters of the Orinoco and the channel which he named the Bocea del Drago, or Dragon's Mouth, he lingered for a few days along this interesting coast, and then sailed directly for Hispaniola.

The harbor of San Domingo was reached on Aug. 30. There Columbus found affairs in a deplorable condition. The criminals transported to the Indies had already begun to exert a baleful influence. The system of *repartimientos*, or personal service, had converted the friendliness of the natives into the most active hostility. Whenever there had been any resistance on the part of the natives, the persons adjudged guilty had been reduced to slavery and sent to Spain. The iniquitous traffic thus thrived apace, and its very prosperity intensified the hostility that had now become universal. To add to the difficulties of the situation the *adelantado* had become involved in a war with a formidable chief in the western part of the island. Though the natives were easily subdued, when they were subjected to tribute they only added to the numbers of those who, on the least chance of success, were ready to break out into open insurrection.

The occasion soon presented itself. Before departing for Spain Columbus had appointed Francis Roldan chief justice for the island. He had an ambitious, arrogant, and turbulent temper, and soon found it easy to gather a strong following about him. He planned to assassinate the *adelantado*, and then make himself master of the island. No effort to bring him to terms was successful. Columbus afterward wrote, concerning the condition of affairs on his arrival, "that he found nearly half the colonists of Hispaniola in a state of revolt." It was not until November that a form of settlement was reached. Columbus agreed to transport the followers of Roldan to Spain with ample provisions, and to allow one slave, "man or woman," to each of Roldan's men. But vessels could not at the moment be obtained, and it was midsummer of the next year before the necessary ships were put at the disposal of Roldan and his men. This delay was unfortunate, for Roldan now refused to be bound by the old contract. It was a year and a half after Columbus's arrival before terms were finally adopted. Roldan submitted only when Columbus agreed to appoint him perpetual judge and write a letter to the Spanish monarchs exonerating him from all blame. But it could hardly have been expected that so conspicuous a reward of insubordination would promote good discipline. No sooner was Roldan brought into subjection than another revolt broke out under a turbulent spirit named Ojeda. Meanwhile accounts of the condition of affairs were finding their way back to Spain. Unfortunately there were no favorable reports to relieve the dark colors. Matters seemed to be growing worse and worse. The returns of gold had been trifling in amount, and even the slaves had proved to be of very little value. Every ship brought demands for further supplies, without bringing any word of improvement in the condition of the colonists. During all this period the old enemies of Columbus in Spain were busy with their work of denunciation.

The monarchs were at length persuaded that the admiral must be suspended from authority. The arrival of a cargo of slaves seems to have completed their determination. The agent selected to execute their authority was an officer of the royal household named Francis de. Bobadilla. He was authorized to look into the condition of affairs, and send back to Spain "any cavaliers or other persons" in case he should find such a course desirable. It is not probable that the monarchs intended to include Columbus in the list of persons subject to arrest, but the language of the commission provided no immunity. Bobadilla arrived at San Domingo on Aug. 23, 1499, and found affairs in extreme disorder. His efforts during more than a year to bring order out of chaos were unsuccessful. Almost his first act showed an energy that amounted to brutality; Columbus was thrown into chains and sent back to Spain, where he arrived in Nov., 1499.

The outcry against the brutality of Bobadilla was universal, and the monarchs made haste to disavow the arrest and set the admiral free. But the affairs of the island were in such a condition that not even Isabella was in favor of restoring him to his command. The most she was willing to do was to provide for the protection of his estate and furnish him with a fleet for further explorations. The squadron of four ships was ready to sail on May 4, 1502.

Fourth Voyage.—The purpose of Columbus in his fourth expedition was to press on still farther to the west, and put himself into definite relations with the Asiatic mainland. He was still unshaken in the belief that the islands thus far explored were only a little E. of Japan and China. After asking in vain for admission to the port of San Domingo to exchange one of his unseaworthy vessels, he began the most perilous portion of his career. Sailing between Cuba and Jamaica he turned to the S. W., and soon found himself skirting the coast now known as Central America. But all the fates seemed to have conspired against him. Tornado after tornado drove his ships about and threatened them all with destruction. However, in the course of the winter months he explored the coast from the Isle of Pines to a point E. of Darien. But want of supplies forced him to turn back. Gale after gale followed, and finally, after experiencing nearly every form of vicissitude, the last of his vessels was wrecked on the northern coast of Jamaica, Aug. 12, 1503. Reduced at times to the point of starvation, he saw that the only hope of rescue was in the possibility of reaching San Domingo in an open boat. One of his companions, Mendez, volunteered to make the attempt. The first effort failed, but the second was successful. It was June 25, 1504, when the admiral and his little crew, after ten months of suffering, were gladdened by the sight of approaching relief.

The turbulent career of Columbus was now practically at an end. After passing a few weeks at San Domingo, he set out with two vessels for Spain, where, after a tempestuous voyage he arrived on Nov. 7. Though scarcely sixty years of age, he was old and broken. It was evident that his work was done. He wrote numerous letters for the purpose of interesting the king in behalf of his son; but to these importunities Ferdinand paid very little heed. Columbus sank rapidly, and, after providing for the disposition of his estate by will, died at Valladolid, May 20, 1506.

After temporary interment at Valladolid and Seville, the remains of the great explorer were transferred to the cathedral at San Domingo at some time before the year 1549. At a later period the remains of other members of the admiral's family found the same resting-place. In the year 1796 a vault in the cathedral, supposed to contain the bones of the discoverer, was opened and its contents were conveyed, with imposing ceremonies, to Havana. In 1877 and 1891, however, evidence was discovered that the vault opened in 1796 was not that of the admiral, but that of one of the other members of the family. It may therefore be regarded as established almost beyond doubt that the ashes of the discoverer still rest in the cathedral at San Domingo.

AUTHORITIES.—Major's *Select Letters of Christopher Columbus*; Harrisse's *Christoph Colomb* (2 vols. 8vo, 1884; expensive but invaluable); Fiske's *The Discovery of America* (2 vols. 8vo, 1891); Cronau's *Amerika: Seine Entdeckung u. s. w.* (2 vols. 4to, 1891–92); Winsor's *Christopher Columbus* (8vo, 1891); Adams's *Christopher Columbus* (12mo, 1891).
See HWEI-SHIN, FUSANG, SAINT BRENDAN, LEIF ERICSSON, VINLAND, NORUMBEGA, and MADOC.
C. K. ADAMS.

Columbus, DIEGO (in Italian, GIACOMO COLOMBO, and by Latin writers called JACOBUS): brother of Christopher Columbus; b. probably at Genoa about 1450. He accompanied the admiral on his second voyage, and when the latter went to explore Cuba was left in charge at Isabella. He subsequently had a good deal to do with the affairs of Hispaniola; but his character was not fitted for command in such turbulent surroundings, and, though he seems to have been kindly and good, he effected little. In later life he became a priest, and in 1509 he accompanied his nephew, Diego Columbus, to San Domingo, where, probably, he died.
HERBERT H. SMITH.

Columbus, or **Colon**, DIEGO: son of Christopher Columbus; b. either at Lisbon or on the island of Porto Santo, near Madeira, about 1476. He went with his father to Spain in 1484, and when the latter left on his first voyage (1492) Isabella made Diego a page at court, where he remained until after his father's death. He inherited the revenues of Hispaniola, but King Ferdinand evaded his claim to the titles and powers of which the admiral had been shorn in his later years; at length he obtained permission to sue for them before the council of the Indies, and

the result was in his favor. Meanwhile he had married Doña Maria de Toledo, niece of the Duke of Alva, and this powerful alliance probably brought Ferdinand to confirm him as Admiral of the Indies and governor of Hispaniola. The title of viceroy, with the appointing power, was withheld. On July 10, 1509, he arrived at San Domingo as governor, bringing his wife and a large retinue. He ruled with a splendor unknown before in the New World, sent Velasquez to conquer Cuba in 1511, and even obtained permission to make settlements on the continent. But some of his measures made him enemies among the colonists, his powers were restricted, and after two visits to Spain he was finally called back in 1523. He went, leaving his wife in charge of the government, and, after following the court in its migrations for two years, seeking redress, he died at Montalvan, near Toledo, Feb. 23, 1526. His widow died at San Domingo in 1549. HERBERT H. SMITH.

Columbus, FERDINAND (or FERNANDO COLON): son of Christopher Columbus by Doña Beatrix Henriquez, a lady of Cordova; b. in Cordova about Aug. 15, 1488. In 1498 he became a page of Queen Isabella; was with his father on the fourth voyage, 1502–04, and was duly recognized in the admiral's will, receiving a large income. He went to San Domingo with his brother in 1509, and probably made a subsequent visit to America. As an attendant on Charles V., he traveled over most of Europe; probably visited Asia and Africa; was employed by Charles in important matters connected with geography; and was about founding an academy and school of mathematics when he died at Seville, July 12, 1539. He wrote a history of the Indies, and a biography of his father, the latter having been used by Las Casas; but both the works in the original are lost. The *Historie*, or Italian version of the biography, first appeared in 1571, and is probably a faulty translation of the work of Ferdinand Columbus, whose name it bears; but even this is somewhat doubtful. Unsatisfactory as such an authority must be, it is the basis of nearly all biographies of Columbus. It has been translated into Spanish, English, and Dutch. Ferdinand Columbus collected a library of over 20,000 volumes, which he willed to the cathedral chapter of Seville. It fell into neglect, and of its priceless treasures hardly 4,000 volumes remain there. It is known as the *Colombina*. HERBERT H. SMITH.

Columbus, or **Colon**, LUIS: son of Diego and grandson of Christopher Columbus; b. at San Domingo, 1521 or 1522. His mother took him to Spain in 1529, and he received the title of Admiral of the Indies, with augmented revenues. He instituted proceedings to recover the title of viceroy, but after long litigation he was forced in 1536 to give up all his claims, receiving in return the island of Jamaica in fief, an estate of 25 leagues square in Veragua, an annuity of 10,000 ducats, and the titles of Duke of Veragua and Marquis of Jamaica. From 1542 to 1551 he was captain-general of Hispaniola. In 1556 his titles and income were further curtailed. He was a person of dissolute habit, was arrested in 1559 for having three wives, remained in prison until 1563, and was then banished to Oran, in Africa, where he died Feb. 3, 1572. His daughter Felipa married her cousin Diego, who became Duke of Veragua, but died childless in 1578. With him the male line of Columbus became extinct. A lawsuit for the title followed, lasting thirty years, and later there were other suits, with several changes. The present Duke of Veragua (b. 1837) is descended from Columbus through Diego, Cristoval, son of Diego, and Francesca, daughter of Cristoval. HERBERT H. SMITH.

Columbus Grove: village and railway junction; Putnam co., O. (for location of county, see map of Ohio, ref. 3–D); 84 miles N. of Dayton; in an agricultural district. Pop. (1880) 1,392; (1890) 1,677; (1900) 1,935.

Columel'la: in botany, the remaining central column or axis formed of the placentas when the carpels of certain fruits have separated; also the axis of the capsules of mosses. In conchology, the upright pillar around which the whorls of univalve shells are wound is called the columella.

Columel'la, LUCIUS JUNIUS MODERATUS: the celebrated Latin writer on agriculture; a native of Gades (Cadiz), in Spain; owned a great estate, Ceretanum (whose location, however, is uncertain); served as tribunus militum in the Sixth legion; traveled much in Spain, Gaul, Italy, Cilicia, and Syria, and spent the latter part of his life in Rome, where he wrote his twelve books *De re Rustica* in the middle of the first century A. D. The work, which is written in a somewhat diffuse though not inelegant style, treats, in many cases with great minuteness, of the soil, the animals, the grains, vegetables, fruits, etc. Very interesting are his remarks on the cultivation of the vine, nearly the same as would be made on the subject in our time. The tenth book, on gardening, is written in dactylic hexameters. A separate book, *De Arboribus* (on trees), which has been preserved, must have belonged to an earlier and less elaborate treatise by Columella on agriculture. The best edition is that by Schneider (Leipzig, 1794). There is an English translation dated 1745. Revised by M. WARREN.

Column: in architecture, a decorated vertical member supporting a lintel or an arch; more slender and ornate than a *pier* (which is a support composed of built-up masonry or brickwork), and more decorative and important than a *post* (which is a single prop or vertical beam destitute of architectural character). A column consists usually of base, shaft, and capital. The base serves to increase the supporting area under the column, and to mediate between its rigid verticality and the horizontal floor or basement; while the capital, the most ornate portion of all, gathers upon the shaft the various superincumbent pressures, and effects a transition from the vertical lines of the shaft to the horizontal or curved lines of the superstructure. The shaft, usually, but not always, cylindrical, is made up of several sections called *drums*, or of a single piece, in which case it is called *monolithic*. See ARCHITECTURE.

Although sometimes executed in stuccoed brick, as in Pompeii, or in metal, as in some modern work, the column is essentially a feature of stone architecture.

The Egyptians employed columns of various forms, but always of great massiveness of proportion. The shafts were sometimes circular, sometimes clustered or quatrefoiled in section, and usually had a slight base and a large and showy capital. The latter was usually either suggestive of a lotus bud or blossom, or campaniform (i. e. shaped like an inverted bell); though sometimes formed like palm branches, or with four heads of Hathor surmounted by a shrine. The whole column was often richly carved and painted with symbolic pictures and hieroglyphics, and at Karnak reached the enormous size of 11½ feet in diameter and over 60 feet in height. Some very early structures, as the tombs at Beni-Hassan, exhibit columns with shafts having eight, sixteen, or more slightly concave sides or faces, surmounted by a plain square abacus. These have been called *proto-Doric*, from their fancied, but by no means demonstrated, influence in the creation of the Greek Doric order.

The forms of columns used by the Greeks were few, but were developed by them to an unrivaled perfection of beauty and refinement. These forms were designed according to a certain established succession of parts which has given rise to the *orders*. Of the three Greek orders the Doric affords us the most ancient examples (as at Corinth and Selinus), although some authorities ascribe to the Ionic an equal antiquity in Asia Minor. The Corinthian was not in use until the Alexandrian period (330 B. C.), and then but rarely by the Greeks, who never perfected its base and entablature. The columns of the orders are distinguished by their *proportions*, the Greek Doric being the most sturdy (4 to 7 times the lower diameter in height); the Ionic next (8 to 10 diameters); and the Corinthian the most slender (10 to 10½ diameters); by their *capitals*, of which the Doric is the simplest and shortest, the Corinthian the tallest and most ornate, and the Ionic a mean between them; by their *flutings*, which are shallower and fewer in the Doric than in the others. The Romans borrowed the magnificent columnar architecture of the Greeks, added the Tuscan and Composite orders, perfected the Corinthian base and entablature, modified the profiles and minor details of all the orders, making them less refined but more ornate, and finally employed the column as a merely decorative adjunct to their national architecture of arches by imbedding it, as it were, in the masonry between the arches. Here it supported nothing in reality, though to the eye it seemed to carry the strongly projecting entablature of each story. But the Romans also employed columns to support their porticos and the vaulting of their baths and temples, preferring in such cases monolithic shafts of polished porphyry or other semi-precious material, and this practice was afterward imitated by early Christian and Byzantine architects.

Early Christian architecture made free use of columns taken from earlier pagan-Roman structures in the erection of its basilicas, where the columns became once more true

supports, carrying the arches under the clerestory. From this time on the column is a feature of interior architecture rather than of the exterior, as was the case with the Greeks. The Byzantine builders, with better logic than that of the early Christians of Rome, rejected the classic base and capital, and devised new forms better adapted to the function of supporting ponderous masses of vaulting. This adaptation of form was, however, carried to much greater perfection by the mediæval architects of Europe, who shook off the last vestiges of classic conventionality. The column was now used more often in groups or clusters than singly; was made sturdy or slender as each case might demand, and its shaft left smooth, or painted with chevrons, stripes, or bands, in brilliant color. Sometimes, as in early French and Norman porches, the shafts were carved in intricate diaper-patterns.

The practice of Renaissance and modern architects has usually followed Roman precedents; but the development of construction in iron and steel has given rise to frequent innovations in the forms of metal columns. The use of monumental colonnades is in our day very rare, those of the Louvre and of the Capitol at Washington being among the finest modern examples.

Columns have been in all ages erected as monuments, standing isolated in the open, to commemorate important names or events, and in most cases surmounted by statues. The Romans excelled in such monuments, of which the Trajan and Antonine columns at Rome are conspicuous examples, and the Vendôme and July columns in Paris the best modern imitations. But such columns are more properly called *pillars*. See Architecture, Byzantine Art, Composite, Corinthian, Doric, Ionic, and Tuscan Orders.

A. D. F. Hamlin.

Column: a military formation of relatively great depth and little front, as distinguished from a "*line*," which has an extended front and little depth. Troops in column are easily moved along roads and over broken country, whereas it is difficult to cause a deployed line to advance or retire over favorable ground without great irregularity or even disruption, and in broken ground it is almost impossible. For this reason lines are always ployed into columns for any extended movement. A column may consist of a company, battalion, regiment, brigade, division, or corps. Upon marches not in the vicinity of the enemy they usually have a front of four men, great depth, and are composed of all arms. Upon the battle-field they were formerly much used for the attack with the bayonet, and varied in strength from a single battalion to a large division. In modern fields they seldom exceed a single company, and are used for manœuver only, being deployed into line before they are exposed to the full effect of small-arm fire. Jas. Mercur.

Colu'sa: capital of Colusa co., Cal. (for location of county, see map of California, ref. 5–C); on the Sacramento river, 60 miles N. N. W. of Sacramento. It is the eastern terminus of the Colusa and Lake R. R., and has 5 churches, 2 public schools, a convent school, flouring-mill, and canning-factory. Pop. (1890) 1,336; (1900) 1,441.

Editor of "Sun."

Col'ver, Nathaniel, D. D.: Baptist divine; b. at Orwell, Vt., May 10, 1794; d. at Boston, Sept. 25, 1870. He received only a very limited education, was by trade a tanner, and served as a volunteer in the war of 1812. He began his ministry in 1836, and was successively settled in Boston (1839), South Abington, Mass. (1852), Detroit (1853), Cincinnati (1856), and Chicago (1861). He was an able preacher, of great power with the masses, and eminent as an abolitionist. After the war he founded in Richmond, Va., the Colver Institute for educating young colored men for the ministry, and was president 1867–70. He published three lectures on Odd Fellowship (Boston, 1844).

Colville Indians: See Salishan Indians.

Colvin, Sidney, M. A.: English author; b. in Norwood, Surrey, June 18, 1845; educated at Trinity College, Cambridge; Slade Professor of Fine Art at Cambridge 1873–86; director of the Fitzwilliam Museum there 1876–84, resigning to become keeper of the department of prints and drawings in the British Museum. He has written for the leading periodicals many critical and historical articles on art and literature; is author of *Children in Italian and English Design* (1872); *Landor* (1881) and *Keats* (1887) in the English Men of Letters series; and has edited *Selections from Landor* (1884), and *Life and Letters of Robert Louis Stevenson*.

Coly, or **Colie**: any one of several small birds of the genus *Colius*, restricted to Africa. All four toes are directed forward, but the inner and outer can be turned backward; the plumage is soft and hair-like, and of a grayish cast (whence they are sometimes called mouse-birds); the tail feathers are long and stiff. The structure of the colies is peculiar, and they are related to the woodpeckers and kingfishers. They creep about the branches, assuming very curious attitudes, and often roost in companies, hanging head-downward.

F. A. Lucas.

Colym'bidæ [Mod. Lat., from Gr. *κόλυμβος*, a diver]: a family of diving birds of the order Pygopodes (*q. v.*). The family comprises the grebes only. See Grebe.

Col'za: a variety of rutabaga or Swedish turnip (*Brassica campestris*) which is cultivated for its seeds, from which oil similar to rapeseed oil is made in Europe. The oil is used for lamps, lighthouses, and machinery, and the leaves and refuse seeds after the oil is expressed are fed to cattle and sheep. The roots are not bulbous. The term is sometimes applied rather loosely to other but similar cruciferous oil-plants.

Co'ma [from Gr. *κόμη*, hair]: in astronomy, the nebulous envelope of a comet's nucleus. (See Comet.) In botany, the name is sometimes given to the head or top of a tree, and also to the hairy crest of certain seeds.

Coma [from Gr. *κῶμα*, deep sleep]: a condition of deep sleep or stupor from which the patient can not be aroused is a symptom of great gravity. The face of the patient is usually congested, the conjunction of the eyes injected with blood, the pupil small or large, the breathing labored, often "stertorous." A variety of causes produce coma, and the symptoms vary with the cause. Among the important causes may be mentioned narcosis from alcohol and opium; Bright's disease; diabetes; apoplexy and injury to the brain; epilepsy; sun-stroke and heat exhaustion; pernicious malarial fever; and severe infectious diseases of various kinds. The stuporous condition of extreme drunkenness is the commonest form, but is unfortunately sometimes assumed to be present when the coma is in reality the outcome of some of the other conditions named. This mistake is all the more apt to occur, because a person feeling faint or ill may take spirits to revive him, and then fall into coma with the odor of alcohol still noticeable, or an intoxicated person may fall and injure the head, or may suffer apoplexy, when again the odor of drink might deceive the ordinary observer. It should therefore be made an invariable rule in prisons, or where drunken persons are kept, that in every case of unconsciousness, no matter whether mere drunkenness be suspected or not, a physician be summoned. The diagnosis of the various causes of coma is so difficult, and the necessity of active treatment so urgent, that to none but experienced physicians should be intrusted the care of these cases.

There are besides coma a few other conditions of unconsciousness, such as hypnotic sleep, trances, and the like, but the rarity of these and the essentially different appearance of the patient readily separate them. The face in these cases rarely presents the same appearance of serious illness as in coma, but rather appears placid or death-like, and it may or may not be possible to arouse the patient.

William Pepper.

Co'ma Berени'ces (i. e. Berenice's hair): a small constellation of the northern hemisphere, between Boötes and the tail of Leo. It is formed of a cluster of very small stars, which may be seen near the zenith in April and May. See Berenice.

Comacchio, kō-mäk'kē-ō (anc. *Comacula*): a fortified town of Italy; province of Ferrara; 3 miles from the Adriatic and 29 miles E. S. E. of Ferrara. It is situated in the marshes of Comacchio, in which great numbers of eels are caught. These and other fish are cured in an excellent manner. It is the seat of a bishopric, and has salt-works. Pop. 9,974.

Comalcalco: See Central American Antiquities.

Coman, Katherine: professor of history; b. 1857 at Newark, O.; educated at University of Michigan, mainly under Prof. (now president) C. K. Adams; succeeded Alice E. Freeman as Professor of History and Economics in Wellesley College 1886; author of *Outlines in Constitutional History of England* (1888); *Outlines in Industrial History* (1892). C. H. T.

Coma'na: an ancient city of Cappadocia, generally surnamed Chryse or Aurea (the golden), in order to distin-

guish it from Comana in Pontus; stood on the river Sarus (Sihun), in a deep valley of the Anti-Taurus range, and was celebrated for the magnificence and splendor with which the goddess Mā, the Greek Enyo, was worshiped there. Indeed, the city was nothing more than an appendix to the temple, and was governed by the high priest. More than 6,000 persons were engaged in the service of the temple, and enormous estates, yielding a royal revenue, were set apart for defraying the expenses. Its site has not been identified.

Comana: an ancient city of Pontus, in Asia Minor; stood on the river Iris (Tocatsu), and is said to have originated as a colony from Comana in Cappadocia. The goddess of the moon was, at all events, worshiped in the city with a pomp and magnificence which reminds one of the Mā-worship in Cappadocia. This circumstance, as well as its central position, made the city a favorite emporium of the Armenian and other merchants. Remains of Comana are still to be seen near the village of Gumenek, which stands on the Tocatsu, 7 miles from Tocat.

Coman'che: town; capital of Comanche co., Tex. (for location of county, see map of Texas, ref. 3–G); on Fort Worth and Rio Grande R. R.; 111 miles from Fort Worth. The town is in a rich agricultural and stock-raising district. Pop. (1880) 704; (1890) 1,226; (1900) 2,070.

EDITOR OF "EXPONENT."

Comanche Indians: See SHOSHONEAN INDIANS.

Comatula: See FEATHER-STAR.

Coma-vigil (i. e. wakeful coma): a name sometimes applied to the semi-comatose state, in which the patient lies apparently comatose, but with constantly open eyes. It occurs in typhus, and more rarely in other fevers. See COMA.

Revised by WILLIAM PEPPER.

Comayagna, kō-mī-aa'gwăă (formerly **Valladolid**, văăl-yăă-dō-leed'): a city of Hondu'ras, in a valley of the same name at the head of the Humaya river, 2,800 feet above sea-level and nearly midway between the Caribbean and Pacific coasts (see map of Central America, ref. 4–G). Until 1883 it was the capital of Honduras; it is still the episcopal city and capital of the province of Comayagua, which has an area of 4,800 sq. miles and a population of about 70,000. The city has a fine cathedral, an ancient university now little frequented, several old convents, a hospital, etc. It was founded by Alonzo de Cáceres in 1540, and was formerly considerably larger than at present. Pop. in 1893 about 10,000.

HERBERT H. SMITH.

Comb [O. Eng. *camb*: O. Sax. *camb*: O. H. Germ. *chamb* > Mod. Germ. *Kamm*, orig. an instrument with teeth; cf. Gr. *γόμφος*, peg, tooth, Skr. *jambha-s*, tooth]: a toothed instrument used for cleaning the hair, as well as for adjusting it and keeping it in place. Combs are made of tortoise-shell, ivory, horns and hoofs of cattle, boxwood, bone, vulcanite, celluloid, German silver, aluminium, and other metals. In all fine combs and in all combs made of bone, ivory, and boxwood the spaces between the teeth are cut out by circular saws mounted on a spindle that revolves rapidly. The plates of the material used are clamped in a holder, which is alternately raised and lowered. The space between two teeth is cut out at each contact between the plate and the saw. At the same time the holder is automatically moved along the breadth of a tooth. The gearing may be arranged so as to make teeth of the length required at an operation. Another process, called twinning, enables two combs to be cut out of a single plate, so that all the material is utilized. The plate of tortoise-shell or horn which is to be used, having been softened by heat, is attached to a carriage that travels under a pair of cutting chisels, which rise and descend alternately while the carriage advances the space of a tooth. The chisels, being inclined to each other at a small angle, make a wedge-shaped cut, so that the pointed end of one tooth is cut out from the roots of the adjacent ones of the other comb. Combs of vulcanite are made by molding india-rubber to the required shape by pressure, and vulcanizing them afterward. See INDIA-RUBBER.

Comba, EMILIO: See the Appendix.

Combaco'num: an ancient city of Hindustan; in the Carnatic; 20 miles E. of Tanjore (see map of S. India, ref. 7–E). It is regarded as a holy city by the Hindus, and has numerous pagodas and tanks, the water of which is supposed to be capable of washing away sin. Pop. (1891) 54,000.

Combe, ANDREW, M. D.: physiologist; b. in Edinburgh, Scotland, Oct. 27, 1797; author of *The Principles of Physiology Applied to the Preservation of Health* (1834; 15th ed. 1860); *The Physiology of Digestion* (1836; 10th ed. 1860); and a *Treatise on the Physiological and Moral Management of Infancy* (10th ed. 1870). D. Aug. 9, 1847.—His brother GEORGE (b. in Edinburgh, Oct. 21, 1788; d. in Surrey, England, Aug. 14, 1858) was a noted phrenologist, and the author of *The Constitution of Man* (1828).

Com'bermere, STAPLETON COTTON, Viscount: British general; b. Nov. 17, 1773. He served in India, and in 1810 obtained command of the cavalry under the Duke of Wellington. At the battle of Salamanca, 1812, he was severely wounded. In 1814 he was raised to the peerage; in 1825 became commander-in-chief in India; and in 1855 a field-marshal. D. Feb. 21, 1865.

Combination: See CO-OPERATION, and TRADES-UNIONS.

Combination, Alternation of Position: See PERMUTATION.

Combs, LESLIE: general and lawyer; b. in Kentucky in 1794. He served with great distinction as an officer in the war of 1812; afterward practiced law in his native State, and became a prominent Whig politician and general of militia. D. Aug. 21, 1881.

Combustion [from Lat. *combu'rere*, *combus'tus*, consume with fire]: the process of burning. In its widest sense combustion means any chemical act accompanied by an evolution of light and heat, though it generally signifies the act of combining with oxygen, and more especially with the oxygen of the air. Fire in its various forms has been the subject of wonder, thought, and investigation, from the earliest times, and the progress of chemistry is intimately connected with the study of combustion. In the article CHEMISTRY (*q. v.*) some account is given of a theory of combustion which controlled the thoughts of chemists for 120 years. This is the phlogiston theory. It is also shown how Lavoisier, toward the close of the last century, succeeded in proving that oxygen is the cause of ordinary combustion. We now know that, when a substance burns in the air, the act consists in a combination of the substance with oxygen, a new product or new products being formed. The heat and light are results of the act of combination. Why heat and light are caused by the combination we do not know, but we do know that whenever two things combine chemically heat is evolved. Whether light is evolved or not depends upon the temperature and the nature of the products formed. If the temperature is high and the product solid, the light is bright. Very few substances combine with oxygen at the ordinary temperature under ordinary conditions. Some substances take fire and burn more easily than others. Thus phosphorus takes fire easily and burns rapidly; charcoal takes fire with difficulty, and burns slowly. Some substances combine slowly with oxygen, without evolution of light. It has been found, however, that whether a certain substance combines slowly or rapidly with oxygen, the quantity of heat evolved by the combination of a given weight of the substance with oxygen is the same. In the tissues of the animal body processes of oxidation are constantly taking place with evolution of heat, and the temperature of the body is thus maintained. These processes of oxidation are accomplished at much lower temperatures than most of those which take place in the open air. Then, again, the processes of decay which are so important are to some extent due to the action of oxygen, the products formed being essentially the same as those formed in active combustion.

When copper or arsenic or antimony is introduced into a jar filled with chlorine gas (see CHLORINE), action takes place, and this action is accompanied by an evolution of light and heat. In principle this act is perfectly analogous to that of ordinary combustion, but the act is much less common. So, too, a candle or gas will continue to burn in chlorine, but of course the products of combustion are quite different from those formed in the air. When hydrogen burns in air, water, a compound of hydrogen and oxygen, is formed. When hydrogen burns in chlorine, hydrochloric acid, a compound of hydrogen and chlorine, is formed. IRA REMSEN.

Comecrudo: See COAHUILTECAN INDIANS.

Comedy [from Gr. *κωμῳδία*; *κῶμος*, merry-making, rout + *ᾠδή*, song; deriv. of *ἀείδειν*, sing]: a species of drama, of which the characteristics in modern usage are that its incidents and language resemble those of ordinary life; that the termination of its intrigue is happy; and that it is distinguished by greater length and greater complexity of plot

from the lighter theatrical piece entitled a farce. The original Attic comedy was a burlesque tragedy in form, in substance a satire on individuals, and founded on political or other matters of public interest. The Attic comedies are usually assigned to three schools—the "old," the "middle," and the "new" comedy. The old comedy lasted till the end of the Peloponnesian war. It was characterized by personalities, great freedom and irregularity, and was a powerful political engine. The middle comedy was more finished, less personal and direct in its aims, satirizing systems and opinions rather than individual men; it ceased with the Macedonian conquest. The new comedy was very much like our modern comedy in scope and general character. See DRAMA.

Comenius, JOHN AMOS (or *Komenski*): educational reformer; b. at Nivnitz, in Moravia, Mar. 28, 1592. His father was a miller, and the family belonged to the sect generally known as the Moravian Brethren. His parents died while he was still a child. He attended first an elementary school at Strassnick, not entering a Latin school until he was sixteen years of age. Later he studied at the College of Herborn, in Nassau, where he first saw the report on Ratich's proposed innovations issued by the universities of Jena and Giessen. Shortly after he wrote his book *Grammaticæ facilioris Præcepta*, published at Prague in 1616. After traveling and studying at Amsterdam and Heidelberg he was appointed to the Brethren's school at Prerau on his return to Moravia, 1614. In the same year he was ordained and in 1618 was placed in the most flourishing of all the churches of the Brethren at Fulneck, where he also had the superintendence of the schools, and where he married and enjoyed some years of happy life. In consequence of the battle of Prague and the occupation of the country by the Spanish troops, Comenius lost his entire property, including his library and manuscripts, in 1621. A year after his wife died and then his only child. In 1624 all Protestants were proscribed, and in 1627 the proscription became so warm that Comenius, who had been in retirement, was obliged to leave the country and retire to Lissa, in Poland, where he was charged with the supervision of the Protestant schools, and became superintendent of all the Moravian churches of that country. Here he devoted himself to the study of educational matters, especially to the question of method, and composed his *Didactica Magna*, or *Great Didactic*, which, however, was not immediately published. In 1631 he published his *Janua Linguarum Reserata* (Gate of Tongues Unlocked), which brought him sudden and world-wide fame. Having formed a scheme of universal knowledge, to impart which a series of works would be necessary that were beyond his resources, he needed a patron. He presently received a call to improve the schools of Sweden, which he declined on account of the unsettled condition of the country. The English Parliament, however, summoned Comenius to England, whither he went in 1641. His coming had been prepared for by his friend, Master Samuel Hartlib, who had even published a sketch Comenius had sent him of his plans (*Conatuum Pansophicorum Dilucidatis*) without his knowledge. At first his prospects in England seemed bright, but the country was in the midst of the civil war, and Comenius, deeply disappointed, finally prepared to return to Lissa. At this moment he received a letter from Louis De Geer, a rich Dutch merchant, who offered Comenius a home and means for carrying out his plans. The offer was accepted, and Comenius joined his patron, who was then living in Sweden. He was most favorably received both by De Geer and Oxenstiern. While approving of his Pansophic plans, these two and the chancellor of the university, John Skyte, both urged him to devote himself first to the reform of the schools and "to bring the study of the Latin tongue to a greater facility." Dependent upon his friends for support, he felt constrained to devote himself to this work in the main for eight years, having settled for the purpose of quiet work in Elbing, in West Prussia. In 1648 he returned to Lissa, where he became senior bishop of the Moravian Brethren. His work at Elbing had received the approval of a commission of learned Swedes, and was published at Lissa as a *Methodus Linguarum Novissima*, the most elaborate of all his treatises on method except his *Great Didactic*. While occupied with his duties as head of the Moravian Church he was called in 1650 to Transylvania by Prince Sigismund Ragotzki to undertake the reform of the schools there. Accordingly he went to Saros Patak, where a model school was formed, and there he labored from 1650 to 1654 and published his most celebrated work, the famous *Orbis Pictus*. This was really an abridgment of his *Janua*, with the important addition of numerous illustrations. It was published at Nuremberg in 1657. Having organized the school he returned to Lissa. The active Protestantism of the Brethren led to the burning of the city by the neighboring Poles, and Comenius again lost all his worldly possessions, including his valued work on *Pansophia* and a Latin-Bohemian dictionary on which he had been at work for forty years. Ultimately, Lawrence De Geer, son of his former patron, gave him an asylum in Amsterdam, where his remaining years were passed in ease and dignity. He earned a sufficient income by giving instruction, and was enabled by De Geer's liberality to publish a fine folio edition of all his writings on education, completed in 1657. Unfortunately in his old age he became the dupe of political and religious impostors. He died Nov. 15, 1671, and was buried at Naarden. The literature concerning Comenius is large.

Comenius may perhaps rightly be considered the founder of method. He strove for a natural instead of an artificial education, for the subordination of Latin to the mother tongue, for the introduction of geography and history into the schools and thus enlarging the scope of school instruction, and for the universality of education as opposed to the idea that only certain special classes and individuals were worthy of it. From the standpoint of to-day it would be easy to criticise him, but in the light of four centuries of experience his works remain among the most important accomplished by any individual in the development of education. He himself said that his objects in school reform were "to give a compendium for learning the Latin tongue that would make the acquisition of it pleasant: to introduce a higher and better philosophy in school-work so as to fit youth for the investigation of the causes of things; and to create a higher tone of morals and manners" (Von Raumer). His personality is among the noblest and his life among the most inspiring in the whole long list of educational heroes and martyrs. The three hundredth anniversary of his birth was widely celebrated both in Europe and America. On Oct. 1, 1891, the Comenius Society was founded for the study and publication of his works. See *Life of Comenius*, by S. S. Laurie (London, 1881; 2d ed. 1884; Am. ed. Syracuse, N. Y., 1893); essay on Comenius in Quick's *Educational Reformers*; *The Educational Review*, Mar., 1892; Joseph Payne, *Lectures on the History of Education* (1892). See CZECH LITERATURE.

C. H. THURBER.

Comes [Lat., orig., a companion]: among the later Roman emperors, the title of an officer with territorial jurisdiction. It was nearly equivalent to count or earl. See COUNT.

Comet-finder: a telescope of low magnifying power and large field of view, used in searching for comets. In the most approved form the telescope is bent at a right angle, with the eye end horizontal, so that the observer can sweep from the zenith to the horizon without moving from his seat.

Comets [from Gr. κομήτης, having long hair, deriv. of κόμη, hair]: heavenly bodies, of a kind wholly distinct from all others yet known, and in some points enveloped in a mystery which science has not been able to penetrate.

The brighter comets, those visible to the naked eye, differ little in their constitution. They consist of three parts: a nucleus, a coma, and a train or tail. The nucleus is a star-like point of light, which in the telescope looks like a small, ill-defined planet. The coma is a cloudy or nebulous light surrounding the nucleus, and growing brighter toward its interior, so that it is difficult to define the exact boundary between the nucleus and the coma. The tail is a train of light, generally fan-shaped, more or less curved, and always extending away from the sun. It shades away so gradually toward its end that it is difficult to assign a definite length to it. In great comets it is the most impressive feature, extending over a long arc of the heavens.

Orbits and Origin of Comets.—It would appear that comets are not, like the planets, permanent members of our system, moving in their orbits through indefinite ages without change. They appear to be fragments of nebulous matter, possibly scattered portions of the raw material from which systems were formed, which have wandered through the stellar spaces for unknown ages, perhaps since the formation of the solar system. One by one they are attracted toward the sun. Revolving around the latter in parabolic orbits, their momentum carries them off again

into the great void from which they came, there perhaps to remain for many ages, until they are once more attracted sunward. This would be the case with all comets if the sun alone were the attracting body. It is the case when the comet, in its path around the sun, does not approach a planet. But when such approach occurs a new action takes place. The planet may so act as to increase the velocity with which the comet is moving. In this case the latter will be sent off in a hyperbolic orbit, and will certainly wander off into space never to return. But the planet may also so act as to diminish the comet's velocity. Then the orbit will be changed to an ellipse, and the comet will become, apparently, a permanent member of our system.

It now appears, when they are thus made members of our system, that comets, like animated beings, are mortal, and that in astronomical measurement their lives may be considered short. As they repeat their revolutions around the sun, their tails, striking and brilliant at first, gradually fade away, and then the nucleus seems to evaporate into the coma, so that, after the lapse of a few centuries, or perhaps a few thousand years, nothing is left but the coma. The coma is gradually reduced to a mere patch of nebulous light. This patch grows fainter and fainter, until at length the most powerful telescopes fail to show a trace of its existence. The comet is completely dissipated. There has been at least one instance during the present generation of the dissipation of a comet in this way, and there are one or two others which will probably never again be seen, although they have long moved in well-defined orbits.

As to their orbits, comets are divided into periodic and non-periodic. The former are those which are known to return at certain definite intervals, generally a few years. The latter can never, so far as we can know from experience, be seen more than once. They move in apparently parabolic orbits, and will certainly not return until centuries at least have elapsed. From what has been said, it will be seen that all the orbits were originally parabolic, and that periodic comets become such only through having been captured by a planet, and thus made a member of the solar system. The theory of the capture of comets by planets has been developed by Prof. H. A. Newton, of the U. S., and Tisserand, of France, so completely that the laws according to which it occurs are now fully understood.

Number of Comets.—To the number of comets it is impossible to set any limit. As a general rule, between twenty and forty appear in each century, which are visible to the naked eye. They may therefore, on the average, be expected to appear at intervals of three or four years. But half a dozen or more are found with the telescope nearly every year, the majority of which are new ones. Of those which actually visit the sun, only a very small fraction are ever seen with the telescope, so that we can hardly doubt the soundness of the view of Kepler that the celestial spaces are as full of comets as the sea of fish. As the great majority of those which visit our system do so only at intervals of many thousands, possibly hundreds of thousands, of years, we can not set any limit to the actual total number of such bodies.

Constitution of Comets.—When a bright comet is carefully examined with a powerful telescope, a bow will sometimes be seen, partially bent around the nucleus on the side toward the sun. If watched from night to night, this bow will be found to expand from the nucleus, become diffused, and finally lose itself in the nebulosity of the coma. Before it does so, however, one or more new ones will be found rising to take its place. These bows seem to be formed of hemispherical envelopes of vapor, which rise from the nucleus itself, dissolve themselves in the coma, and are gradually repelled from the sun so as to form the material of the tail. If this be so, it accounts for the gradual disappearance of the nucleus by evaporation; the nebulous coma is simply the matter which has evaporated from the nucleus. That the tail of a comet is not a solid appendage carried with it must be evident. The centrifugal force which a coherent body would suffer if swung around the sun like the tails of many comets would be such that no known substance could be strong enough to sustain it. There can be no doubt that the tail is simply of the nature of a stream of a vapor, continually thrown off from the comet. Its direction shows that it is always repelled by the sun. That it is so repelled by the sun, while the nucleus is attracted, is one of those mysteries which science has not yet been able to solve. The constant evaporation of cometary matter to form the tail explains the shortness of life of these bodies.

Spectroscopic observations upon the light of comets have only served to deepen the mystery which surrounds them. The spectrum of a bright comet is found to consist principally of three bands, and bears so striking a resemblance to that of certain hydrocarbons that no doubt of their identity seems possible. But when a spectrum is obtained from a hydrocarbon the latter must be so hot as to be self-luminous. Now, it would seem certain that a comet is neither hot nor self-luminous. All the laws of heat would lead us to suppose that it must rather be intensely cold, except when it comes inside the orbit of the earth; and were it self-luminous, we should see it when very distant from the sun. As a matter of fact, observations seem to show that its brilliancy varies with its distance from the sun, according to the same law as that of an opaque body. On the other hand, the spectrum of sunlight reflected from a body having an atmosphere of hydrocarbons ought to be the negative of that shown by the comet; it should be dark just where the comet spectrum is bright. All we can say, therefore, is that the light of the comet must be subject to some action which we have no means of producing in our laboratories.

Among the most remarkable of known comets is one with which the names of Lexell and Chandler may be associated. In 1770 Messier discovered a comet, known as Lexell's, which remained visible a long time, and observations showed the orbit to be an ellipse whose major axis was only three times the diameter of the earth's orbit, and indicated a period of five and a half years. It was impossible to identify this comet with any before observed, and yet it was very difficult to conceive that a bright comet with so short a period should have previously escaped observation. What was still more remarkable, it was never seen again, though carefully looked for in the places where according to previous observations its orbit should have been. It gave occasion to many sarcasms by the wits of the day at the expense of astronomers. At present the explanation is easy. The comet was never seen before 1770, because of its nearest point to the sun having been as distant as the orbit of Jupiter. In 1767 it was in such close proximity to Jupiter, moving in the same direction, and nearly in the same plane, that the attraction of this great planet entirely changed its orbit. Its passage to the perihelion in 1776 took place by day, and in 1779, before another return, it again encountered the vast body of Jupiter, the attraction of the planet deflecting it into more distant regions, and so changing the form of the orbit that it was not again seen for more than a century.

In 1889 a comet was discovered by Brooks, of New York State, which proved to have a period of only about seven or eight years, and yet to be moving in an orbit not before recognized. A very little computation solved the mystery, by showing that in the year 1886 it had passed in close proximity to the planet Jupiter, which must have captured it. Mr. S. C. Chandler, of Cambridge, was able to compute the disturbing action of Jupiter upon it, and show that in all probability it was identical with Lexell's comet, which had in the meantime been moving in an orbit completely outside that of Jupiter. It had been brought into the system by the attraction of this planet, and thrown into a new orbit by the same cause.

The comet of 1843 was remarkable for its near approach to the sun. A very slight change in its direction would have thrown it into the body of the sun itself. When it passed perihelion it was visible to the naked eye in full day, causing alarm the world over, and becoming connected in men's minds with the prediction of Miller that the world would end in that year. What is most remarkable about its orbit is that in 1880 another comet was found to be moving in an orbit so near to it that it was at first questioned whether the two bodies might not be identical. This, however, is impossible; indeed, the theory was set at rest by the speedy appearance of a third body, in 1882, following in the same orbit. It would therefore seem that these three comets were originally in each other's neighborhood in the stellar spaces. Perhaps they were pieces of one fragment of nebulous matter, and were gradually attracted toward the sun, one by one.

Halley's Comet.—The history of this earliest and most celebrated of all the periodic comets has been so often written that little need be said of it here. Its period ranges from seventy-five to seventy-seven years. Its last return

was in 1835; it may therefore be again expected about the year 1911. It is the only periodic comet conspicuous to the naked eye. That its tail at the last appearance did not correspond in brilliancy and extent with that recorded in earlier centuries may be accounted for by the gradual dissipation of the cometary matter, already described. It was the object of very remarkable observations by Bessel and others. The orbit was so carefully calculated that the last return to perihelion was predicted within three days. In all probability the next return will be predicted with yet greater precision.

Biela's Comet.—This comet is remarkable because it is one of which the annihilation has undoubtedly been ascertained. It was first observed in 1772, and the fact of its discovery at that time shows that it could not have been what we should now call a faint comet. It was again observed in 1805, but not recognized. It was rediscovered for the third time in 1826 by the Austrian whose name it bears, and now was found to be periodic and identical with those seen in 1772 and 1805. The period was found to be six years and eight months. In 1845 the first symptom of dissolution was seen in the separation of the coma into two distinct parts, so that there were two comets, a large and a small one. The latter grew at the expense of its companion until they were nearly equal. The next return took place in 1852. The two companions were then found to be more than a million miles apart, and of nearly equal brightness. Neither of them has since been seen; but in 1872, when the earth passed the point in its orbit near where the comet ought to have been passing, a meteoric shower was observed, the result of the passage of the invisible fragments of the vanished comet through our atmosphere. This meteoric shower is now well recognized, and the meteors which caused it are known as the Andromeds, because they radiate from the constellation Andromeda.

A more complete account of the relation between meteors and comets will be found in the article on the former subject.

The following is a list of the comets which have been found to revolve around the sun in periods of less than one hundred years. They are named after their discoverers. The second column gives the time of one revolution around the sun; the third, the year and month of the last-observed perihelion passage. Several of them were looked for in vain at their last return, and have quite likely ceased to exist, but, as a new one is discovered every two or three years, there is no danger of their becoming extinct.

LIST OF PERIODIC COMETS.

NAME.	Period (in years).	Last observed perihelion passage.
Encke's	3·3	1891, Oct.
Tempel's II.	5·2	1878, Sept.
Barnard's	5·4	1884, Aug.
Brorsen's	5·6	1879, Mar.
Winnecke's	5·6	1886, Aug.
Swift's	5·5	1880, Nov.
Tempel's I.	6·0	1879, Apr.
Brooks's	6·3	1886, June
Spitaler's	6·4	1890, Oct.
D'Arrest's	6·7	1890, Oct.
Wolf's	6·7	1884, Nov.
Finlay's	6·7	1886, Nov.
Brooks-Lexell's	7·0	1889, Sept.
Faye's	7·4	1889, Dec.
Tuttle's	13·8	1885, July
Pons's	71·0	1884, Jan.
Olbers's	72·0	1887, Oct.
Halley's	75·0	1835, Nov.

SIMON NEWCOMB.

Comfort, GEORGE FISK, L. H. D.: educator; b. Sept. 20, 1833, at Berkshire, N. Y.; graduated at Wesleyan University 1857; taught in Amenia Seminary 1857–58; Fort Plain Seminary 1858–59; Norman's Female College 1860; traveled and studied in Europe and the East 1860–66; Professor of Modern Languages and Æsthetics, Alleghany College, 1866–68; chief originator and organizer of the American Philological Association 1869, and secretary of the same 1869–73; one of the principal founders of the Metropolitan Museum of Art, New York, 1869–72; lecturer on Christian Archæology, Drew Theological Seminary, 1868–73; art editor *Northern Christian Advocate* 1874–92; Professor of Modern Languages and Æsthetics 1872–87, and dean of the College of Fine Arts, Syracuse University, 1873–92; president of the Southern College of Fine Arts, La Porte, Tex., 1892; author of *Æsthetics in Collegiate Education* (1867); *Art Museums in America* (1869); *Modern Languages in Education* (1870); a series of text-books for the study of the German language and literature (1870); *Woman's Education and Woman's Health* (1874); *The Land Troubles in Ireland* (1878).

Comfrey, kŭm′frē: the name given to several plants, natives of Europe and Asia, of the genus *Symphytum* and family *Boraginaceæ*. They have a fine-toothed calix and the throat closed by five converging awl-shaped scales. *Symphytum officinale* is often cultivated in gardens. Its roots are used in decoctions in diarrhœa, etc. The prickly comfrey, *S. orperrimum*, is cultivated as a forage plant.

Comines, kō′meen′, or **Commines**: a town on the S. W. frontier of Belgium; divided by the river Lys into two nearly equal parts, one of which is in France. It is 9 miles N. of Lille (see map of Holland and Belgium, ref. 10–B). Here are important manufactures of ribbons, threads, etc. Pop. of the French town (1891) 5,435; of the Belgian (1890) 4,803.

Comines, PHILIPPE, de: Lord of Argenton; historian and statesman; b. near Menin, Flanders, in 1445. The son of an ancient race, his education was conducted with the greatest care, notwithstanding he had early lost his parents. He entered the service of Charles the Bold, who employed him in important diplomatic business. About 1472 he proved untrue to the duke, forming a secret compact with Louis XI. while he was held a prisoner by Charles, who took him captive at Peronne, and became a minister of the French king, his enemy. After the death of Louis XI., Comines was an adherent of the Duke of Orleans, aiding that prince in his ambitious plans against the French Government. This cost Comines his ministerial office; whereupon he aided the Bourbon prince the more zealously. His last years were spent in quasi-disgrace, Louis XII. making no use of his political talents. This period of his life he employed in writing his *Mémoires*, for which he is now chiefly known. They cover the years from 1464 to 1498, and show the writer to have been a profound statesman, an acute and impartial observer, a man devoid of moral enthusiasms. His fresh and naïve style reflects impartially the splendors and the weaknesses of his time; but the new application of political reflection to historical events entitles him to be deemed the first modern historian of France. The *Mémoires* first appeared in 1523; later editions are those by Dupont (1840–47); Kervyn de Lettenhove (1867–74); Chantelauze (1881). See also F. van Holst, *P. de Comines*, and R. Chantelauze, *P. de Comynes, étude biographique d'après nouveaux documents*, in his *Portraits historiques* (Paris, 1886). D. Oct. 18, 1511.

Revised by A. R. MARSH.

Comiso, kō-mee′sō: a town of Sicily; province of Noto; about 41 miles W. S. W. of Syracuse (see map of Italy, ref. 10–F). It has manufactures of paper. Pop. 20,000.

Comitan: city in the east part of the state of Chiapas, Mexico (see map of Mexico, ref. 9–J). It is noted for its fairs, which are much frequented by traders and by the country population. Pop. (1889) about 7,000.

Comitia, kō-mish′ĕe-a [Lat. plur. of *comitium*, assembly, place of assembly; *com*, together + *ire*, go]: in ancient history, were certain political assemblies of the Roman people. The comitia were of three kinds, distinguished by the epithets *curiata*, *centuriata*, and *tributa*. The comitia curiata were the assemblies of the patrician houses or *populus*, and in these, before the plebeians attained political importance, was vested the supreme power of the state. The name curiata was given because the people voted in *curiæ*, each curia giving a single vote, representing the sentiments of the majority of the members composing it, which was the manner in which the tribes and centuries also gave their suffrages in their respective comitia. After the institution of the comitia centuriata, the functions of the curiata were nearly confined to the election of certain priests and passing a law to confirm the dignities imposed by the people. The comitia centuriata were the assemblies of the whole Roman people, including patricians, clients, and plebeians, in which they voted by centuries. By the constitution of the centuries these comitia were chiefly in the hands of the plebeians, and so served originally as a counterpoise to the powers of the comitia curiata, for which purpose they were first instituted, it is said, by King Servius Tullius. These comitia quickly attained the chief importance, and public matters of the greatest moment were transacted in them, as the election of consuls, prætors, etc. The comitia tributa were the assemblies of the plebeian tribes. According to tradi-

tion they were first instituted after the expulsion of the kings, and in them were transacted matters pertaining to the plebeians alone, as the election of their tribunes, etc.

Comity of Nations: See INTERNATIONAL LAW, PRIVATE.

Commander: a naval officer of the grade next below that of captain, and ranking with lieutenant-colonel in the army. In the English navy a commander may be the executive officer of a large ship, or he may, as in the U. S. navy, command a smaller vessel. There are eighty-five commanders allowed on the active list of the U. S. navy.

Commander-in-chief: the officer in whom is vested the supreme command of all the land or naval forces of any nation. In Great Britain he is appointed by the sovereign and holds office for life. His duties have never been clearly defined as distinguished from those of the cabinet minister who presides over the War Office. He is responsible for the discipline and efficiency of the army. The office of the commander-in-chief, technically called "Horse Guards," comprises the departments of the military secretary, the adjutant-general, and quartermaster-general. He is now strictly subordinate to the Secretary of War, and is responsible to Parliament. The office is usually vacant, and its duties performed by a "field-marshal commanding in chief." In the U. S. the President is *ex-officio* the commander-in-chief.

Commander Islands (Russ. *Komandorski*): two Russian islands lying in the line of prolongation of the Aleutian islands; near the Kamtchatkan coast; in about lat. 55° N., lon. 167° E. The name was given in honor of Bering (known in those regions as the commander), whose death occurred on the westernmost, which is also called by his name. Bering island is 50 miles long, with a greatest breadth of 17 miles. Medny or Copper island is about 30 miles long, but not more than 5 broad. Copper has been found here, but in small quantities. The islands are mountainous and without trees. The climate is mild for the latitude. Earthquakes are frequent. Pop. about 300. M. W. H.

Commandments: See DECALOGUE.

Commandments of the Church: rules imposed upon the laity of the Roman Catholic Church. It is held by Roman Catholics as taught by the Scriptures that the Church, being a perfect society, has power to make rules for her members, so that things lawful in themselves become unlawful by the Church's prohibition. The Roman catechism makes no special enumeration of these commandments; but such an enumeration is generally found in popular elementary catechisms, and the number is reduced to five or six. They are frequently called the six commandments, and are variously given. Those most commonly taught are as follows:

1. The Catholic Church commands her children on Sundays and holy days of obligation to be present at the holy sacrifice of mass, to rest from servile works on those days, and to keep them holy.
2. She commands them to abstain from flesh on all days of fasting and abstinence, and on fast days to eat but one meal.
3. She commands them to confess their sins to their pastor at least once a year.
4. She commands them to receive the blessed sacrament at least once a year, and that at Easter or during the paschal time.
5. To contribute to the support of their pastor.
6. Not to marry within the fourth degree of kindred, nor privately without witnesses, nor to solemnize marriage at certain prohibited times. Revised by JOHN J. KEANE.

Commemoration Day: the day on which solemnities are annually held in the University of Oxford, England, in remembrance of the founders and benefactors of the university, when speeches are made, prize compositions in prose or poetry recited, and honorary degrees conferred on distinguished persons. The same term is used to designate the degree day of the University of King's College, Windsor, N. S., the oldest British colonial college. In "'varsity" slang the word is shortened to "commem." W. S. P.

Commen'da [Late Lat., charge, trust, deposit]: originally the conferring of a vacant benefice for temporary administration on a clergyman already provided with one; afterward it came to be the bestowal of such a benefice for a long period or for a lifetime. As, however, after the eleventh century abuses crept in, and influential ecclesiastics especially availed themselves of the commenda to increase their incomes, it was found necessary to oppose it. This was done by Gregory VII. and Innocent X., and also at the Councils of Constance and Trent. Formerly in the Church of England, when a clergyman was promoted to a bishoprie, all his other preferments became void, but the interest in the living was retained by its being *commended* to the care of a bishop (called the commendatory) by the crown till there should be provided for it a proper pastor. Such a living was called an *ecclesia commendata*, and it was said to be held *in commendam*. The holding of benefices and livings *in commendam* in England has been abolished by law since 1836. Among the ecclesiastical orders of knights the name *commenda* (commandery) was given to the domain over which the members (*commendatores*) exercised jurisdiction.

Commensalism [from Lat. *com*, together + *mensa*, table]: that association of animals which is not a true parasitism, but where each gains an advantage from the other's presence, or at least does not suffer by it. Instances are comparatively numerous, and vary from a mere association of freely moving forms to instances where they become closely united. Of the first type may be mentioned those fishes which live among the tentacles of certain jellyfishes, and profit not only by the defense afforded by the nettle cells of the latter, but get certain choice morsels of food from the particles dropped by the host. Somewhat similar are the associations between ants and plant-lice. Of the second type may be mentioned those combinations which occur between certain crabs and sea-anemones. Here the crab fastens a sea-anemone to his back and carries it about with him. He profits by the protection of the nettle cells. The anemone gets his food from the particles which drop from the crab's meals. For another type, see SYMBIOSIS. J. S. KINGSLEY.

Commensurable [from Lat. *com*, together + *mensura'bilis*, that can be measured; deriv. of *mensu'ra*, measure]: Two quantities are said to be commensurable when some common unit can be found which will measure them both, or when their magnitudes have the ratio of some two whole numbers. When no such unit or common measure exists they are called incommensurable. See INCOMMENSURABLE. S. N.

Commentry, kom'măăn'tree': a town of France; department of Allier; on the Œil; 8 miles S. E. of Montluçon; in the center of important coal-fields (see map of France, ref. 6–F). It derives its prosperity from coal mines and ironworks, and has increased rapidly in recent times. Its manufactures of looking-glasses are very celebrated and remunerative. Pop. (1896) 12,632.

Commerce: the exchange of goods in considerable quantities between producers remote from one another.

Exchange arises out of the division of labor, and is the only means by which division of labor can be secured. If A has superior skill in farming, B in weaving, and C in shoemaking, the necessity for a system of exchange arises in order that the community as a whole may secure the most aggregate comfort with the least labor. As long as this exchange takes the form of barter between individuals who produce goods for one another to order, we can not speak of commerce; but when money is substituted for barter, and when the producers either carry their wares to market themselves or sell them to a storekeeper as an intermediary, we have the beginning of a commercial system.

In the Middle Ages commerce was carried on by markets. (See MARKET and FAIR.) Down to about the twelfth century each village, as a rule, formed an independent community, having its own blacksmith, its own miller, and its own craftsman, as far as handicraft was developed, while the operations of spinning and weaving were carried on by each household for itself. But as towns grew up they acquired market privileges from the king. Certain days were set on which the country people would carry their goods to town and make their purchases. These market-towns became more and more the residence of craftsmen, and the place in which the various forms of manufacture first developed. Stores or shops, in the modern sense, did not as yet exist. The farmer sold his produce at the market and bought his goods of the craftsman. But the first step toward commerce had been taken, for he had ceased to depend upon himself for all his supplies. Survivals of this system of markets are to be seen in almost every town of continental Europe and even in the United Kingdom. In America such markets are chiefly used for the sale of certain specific classes of perishable goods. Those goods which can be kept

without damage are now sold in another fashion. Instead of being brought to market by the producers and sold on their own account, they are purchased by merchants or storekeepers, who act as intermediaries, furnishing a constant series of supply to those who wish to buy goods, and a more or less constant demand for those who have goods to sell. We find a mercantile class organized, possessing capital, which it uses in the purchase of goods from the producers, to be sold at higher prices to those who want them, at such times and in such quantities as they may choose. This substitution of stores for markets, of regular channels of trade for irregular ones, forms the basis of the modern commercial system.

The first race to carry on commerce on a large scale was the Phœnician, which furnished the most daring mariners of the ancient world; first in Sidon and Tyre, whose greatness goes back some ten centuries before the Christian era; and later on an even larger scale in the Phœnician colony of Carthage. Much of the commerce of the later Roman republic and the early empire partook of the nature of tribute rather than of trade. With the downfall of the empire the lack of public security caused a great contraction of commerce as part of the general lapse into barbarism. Not until the rise of free or half-free cities on the shore of the Mediterranean was there a renewal of commercial activity. Towns like Venice, Pisa, or Genoa derived much of their wealth from trade with the East; and the crusades, by developing intercourse between East and West, laid the foundation of the wealth of these cities. A few French trading cities also rose to importance; while the Moors in Spain showed themselves patrons of commerce as well as of science and art. Most important of all in some respects was the Hanseatic League (*q. v.*) of free towns centering in Germany, but extending as far as England in the west, Norway and Sweden in the north, and the very heart of Russia in the east.

With the substitution of the modern system for fendalism, beginning about the year 1300, national commerce began to take the place of municipal. The mariner's compass, already known to the Chinese, was introduced into Europe in 1302; and this rendered possible the substitution of open-sea voyages for the coasting trade. The Portuguese were the first to take advantage of this invention, discovering in rapid succession Porto Santo, Madeira, the Azores, and the various coast localities of Africa as far as the Cape of Good Hope. In 1497 Vasco da Gama made the sea-passage to the East Indies. For the time being Lisbon seemed destined to become the commercial center of the world; and the Catholic Church supported the claims of Portugal to the eastern discoveries. Meantime the Spaniards were not idle, and songht to discover a *westward* passage to the Indies, in the hope of counterbalancing the claims of Portugal. It was in connection with this attempt that Columbus, an Italian under Spanish patronage, discovered America (1492), and paved the way for the Spanish conquests of Mexico by Cortez (1520), Peru by Pizarro (1529), and Chili by Almagro (1535). Meantime, in 1514, Magellan had actually made the westward passage to the East Indies, sailing through the strait which bears his name; and there ensued a period of active rivalry between Spain and Portugal in the establishment of stations for Indian and American commerce. But the power of Spain and Portugal as leading commercial nations was short-lived. Less than a hundred years after the period named it gave place to that of Holland and England. (See East India Company and Navigation Laws.) The century following was signalized by the rise of France as a great commercial power, while the nineteenth century witnessed a similar development first of the U. S. and then of Germany.

Thus far we have spoken chiefly of foreign commerce. The development of inland or internal commerce has come later, but has been of even more importance in modern times. Down to the end of the seventeenth century the badness of the roads formed an efficient check upon transportation of all kinds. The only good roads in many parts of Europe were actually the work of the Roman empire. For details as to the substitution of good roads for bad, the introduction of canals, and the development of the railroad as a chief means of movement of goods and passengers, see Transportation. Hand in hand with the development of the physical means of commerce is found a development of the modern credit system which is of equal importance in facilitating commercial transactions. (See Money, Currency, and Credit.) For an account of the commercial legislation looking to the removal of restrictions, see Free Trade and Reciprocity. The upshot of all this is that the commerce of the world in a single day is now probably greater in value than that of any year in the eighteenth century or any decade in the seventeenth.

Until a comparatively recent period government policy has been, as a rule, rather unfavorable to the development of commerce. In the first place, taxes on trade furnish such an easy method of raising revenue that wholly disproportionate burdens of this kind were put upon the community. In France a system of local trade taxes continued down to the Revolution of 1789. In other parts of continental Europe the case was quite as bad. Remnants of these taxes survive in the *octroi*, the municipal tax levied on articles of food which enter the city limits. It is needless to add that such taxes of this kind were, as a rule, very bad in their working, and that they are prohibited by the Constitution of the U. S. The case is somewhat different with customs duties at the frontiers. Such taxes are easier to collect than local taxes of the same sort, and have at times seemed to further the development of national independence. The whole subject is discussed in the articles Free Trade and Protection.

The second reason why commerce was looked upon unfavorably was due to the fact that the governments of mediæval Europe were in large measure in the hands of the landed classes, while commerce was managed either by the artisans or by the capitalists, more commonly the latter. Anything which helped agriculture was a direct help to the governing classes. Anything which helped commerce tended to raise rivals against them. Under these conditions a public sentiment arose which, in continental Europe at any rate, made it impossible for a nobleman to engage in commerce, and stigmatized it as a distinctly subordinate operation to that of land-holding.

The attempts to favor commerce did almost as much harm as the attempts to tax it. The ordinary method in mediæval times was by the grant of a monopoly or special trading privilege to certain individuals. Such monopolies may have been necessary at the outset, but they were almost always liable to be abused, and to prevent subsequent progress. A marked instance is furnished by the history of the East India Company. At first it was important to give a monopoly of trade to a group of men who would take the responsibility of maintaining the police service, a system of defense against pirates or natives which the government was unable to organize. But when the government grew stronger and pirates and natives grew weaker, the monopoly which had been at first justifiable became more and more liable to abuse. (See East India Company.) An interesting attempt to develop a large kind of monopoly is found in the navigation laws, whereby England attempted to secure to her own subjects a monopoly of the carrying trade. An attempt was made to restrict the trade between England and any other country to the ships belonging either to England or to the country with which it dealt, and to prohibit the employment of third parties in the carrying trade. These laws were directed against the Dutch, and were in some measure successful. But the universal belief now is that Holland's loss was by no means England's gain. It constituted a general burden on the trade of the world by preventing it from being done in an efficient and economical manner; a burden in which all nations, through retaliatory laws, suffered in greater or less measure, so that in the second quarter of the present century such laws were gradually abolished. The injury done to the British colonies in America by these navigation laws is specified in the Declaration of Independence as one reason for absolving allegiance to the crown.

With the abolition of navigation laws and the cheapening of transportation, the amount of commerce has developed enormously. It is estimated that the effective carrying power of the commercial marine of the world in the decade from 1830 to 1840 increased 2·10 per cent. annually; from 1840 to 1850, 3·65 per cent. annually; from 1850 to 1860, 5 per cent. annually; from 1860 to 1870, 2·74 per cent. annually; from 1870 to 1880, 3·56 per cent. annually; and from 1880 to 1890 probably more than from 1870 to 1880. It is probable, though statistics are not equally accessible, that the internal commerce and the means of carrying it have increased in even more rapid ratio. Dr. Neumann-Spallart has made an estimate of the international trade of the world in the years from 1868 to 1885 from which it appears that, in spite of the fall in prices, the total value of the foreign commerce of all nations had increased during that period from $10,500,000,000 annually

1. CAMPHOR PLANT, LEAVES AND FLOWER
2. CAMPHOR BLOSSOM
3. CAMPHOR FRUIT
4. INDIA-RUBBER PLANT, LEAVES AND FLOWER
5. INDIA-RUBBER FLOWER
6. INDIA-RUBBER FRUIT
7. GUM ARABIC TREE
8. GUM ARABIC FRUIT
9. GUM ARABIC BLOSSOM
10. COCOANUT PALM

PLANTS O

COMMERCE

11. DATE PALM
12. BANANA TREE
13. SAGO PALM
14. NUTMEG PLANT
15. PEPPER PLANT
16. PEPPER SEED VESSEL
17. CLOVE PLANT
18. TEA PLANT
19. TEA SEED VESSEL
20. COFFEE PLANT
21. COCOA PLANT
22. POPPY
23. PERUVIAN-BARK PLANT
24. ALOES BLOSSOM
25. ALOES LEAF

to nearly $15,000,000,000. Taking the fall in prices into account, this means nearly a doubling of the amount of goods moved. Of this foreign commerce in the year 1885 not quite $10,000,000,000 was to be found in Europe, something over $2,000,000,000 in America, and the balance chiefly in Asia. Of all the individual nations the commerce of Great Britain is the most important, amounting to nearly 20 per cent. of the whole. France, Germany, and the U. S. are not far apart, each with something like 10 per cent., while the Netherlands, Russia, British India, Austria, Belgium, Italy, and Australia follow in the order named. The change from 1885 to 1900 would not materially alter these proportions. It is to be understood that these figures refer to the actual commerce, as measured by imports and exports, and not to the tons handled by the ships of the different nations.

The following table shows the value of the imports and exports of merchandise of the U. S. carried respectively in U. S. vessels and in foreign vessels, during each fiscal year from 1857 to 1900, inclusive, with the percentage carried in vessels of the U. S.:

YEAR ENDING JUNE 30—	IMPORTS AND EXPORTS—			Percentage carried in U. S. vessels.
	In U. S. vessels.	In foreign vessels.	Total.	
1857	$510,331,027	$213,519,796	$723,850,823	70·5
1858	447,191,304	160,066,267	607,257,571	73·7
1859	465,741,381	229,816,211	695,557,592	66·9
1860	507,247,757	255,040,793	762,288,550	66·5
1861	381,516,788	203,478,278	584,995,066	65·2
1862	217,695,418	218,015,296	435,710,714	50·0
1863	241,872,471	343,056,031	584,928,502	41·4
1864	184,061,486	485,793,548	669,855,034	27·5
1865	167,402,872	437,010,124	604,412,996	27·7
1866	325,711,861	685,226,691	1,010,938,552	32·2
1867	297,834,904	581,330,403	879,165,307	33·9
1868	297,981,573	550,546,074	848,527,647	35·1
1869	289,956,772	586,492,012	876,448,784	33·1
1870	352,969,401	638,927,488	991,896,889	35·6
1871	353,664,172	755,822,576	1,132,472,258	31·8
1872	345,331,101	839,349,362	1,212,328,233	29·1
1873	346,306,592	966,723,651	1,340,900,221	26·3
1874	350,451,994	939,206,106	1,312,680,640	27·1
1875	314,257,792	884,788,517	1,219,434,544	25·9
1876	311,076,171	813,354,987	1,142,904,312	27·6
1877	316,660,281	859,920,536	1,194,045,627	26·9
1878	313,050,906	876,991,129	1,210,519,399	26·3
1879	272,015,692	911,269,232	1,202,708,609	22·9
1880	258,346,577	1,224,265,434	1,503,593,404	17·42
1881	250,586,470	1,269,002,983	1,545,041,974	16·48
1882	227,229,745	1,212,978,769	1,475,181,831	15·17
1883	240,420,500	1,258,506,924	1,547,020,316	16·03
1884	233,699,035	1,127,798,199	1,408,211,302	17·16
1885	194,865,743	1,079,518,566	1,319,717,084	15·29
1886	197,349,503	1,073,911,113	1,314,960,966	15·52
1887	194,356,746	1,165,194,508	1,408,502,979	14·29
1888	190,857,473	1,174,697,321	1,419,911,621	13·90
1889	203,805,108	1,217,063,541	1,487,533,027	14·34
1890	202,451,886	1,371,116,744	1,647,139,093	12·85
1891	206,439,725	1,450,101,087	1,729,397,006	12·86
1892	220,173,735	1,564,558,808	1,784,732,543	12·33
1893	197,675,507	1,428,316,568	1,626,082,075	12·2
1894	195,268,216	1,273,022,456	1,468,290,672	13·3
1895	170,507,196	1,285,896,192	1,456,403,388	11·7
1896	187,691,887	1,377,973,521	1,565,665,408	12·
1897	189,075,277	1,525,753,766	1,714,829,043	11·
1898	161,328,017	1,582,492,479	1,743,820,496	9·3
1899	160,612,206	1,646,263,857	1,806,876,063	8·9
1900	195,084,192	1,894,444,424	2,089,528,616	9·3

The values of the principal articles of domestic exports during the three years ending June 30, 1900, were as follows:

ARTICLES.	1898.	1899.	1900.
Cotton, and manufac. of	$247,977,311	$233,656,490	$266,992,065
Provisions, comprising meat and dairy products	167,340,960	175,508,608	184,453,055
Breadstuffs	333,897,119	273,999,699	262,744,078
Mineral oils	56,125,578	56,273,168	75,611,750
Animals	46,243,406	37,880,916	43,585,031
Iron and steel, and manufactures of, including ore	70,441,109	93,782,431	121,992,590
Wood, and manufac. of	37,513,252	41,489,526	50,598,416
Tobacco, and manufac. of	26,990,073	30,646,216	35,432,512
Leather, and manufac. of	21,113,640	23,466,985	27,293,010
Coal	11,683,749	13,661,028	19,502,813
Oil cake and oil-cake meal	12,581,534	14,531,142	16,757,519
Copper, and manufactures of, including ore	32,829,202	36,864,679	59,871,536
Sugar and molasses	2,111,658	2,953,888	3,697,671
Chemicals, drugs, dyes, and medicines	9,441,763	10,995,289	13,203,610
Fish	4,674,659	5,169,811	5,427,469
Agricultural implements	7,609,732	12,432,197	16,099,149
Carriages, cars, and other vehicles, including cycles	10,270,948	9,860,164	9,905,610
Vegetable oils	12,019,069	13,809,335	16,345,056
Totals	$1,110,864,762	$1,086,981,572	$1,229,512,940
Total domestic exports	$1,210,291,913	$1,203,931,222	$1,370,763,571

In cotton and provisions there has been a slight increase, and in breadstuffs a slight decrease. The most remarkable increases are shown in iron and steel and in copper, which increased 73 per cent. and 52 per cent. respectively.

The following table shows the distribution of the commerce of the U. S. by leading countries and grand divisions of the globe, during the year ending June 30, 1900:

COUNTRIES AND GRAND DIVISIONS.	Exports.	Imports.	Total exports and imports.	Excess of exports + or of imports −.
United Kingdom	$533,819,545	$159,582,401	$693,401,946	+$374,237,144
Germany	187,347 889	97,374,700	284,722,589	+89,973,189
France	83,335,097	73,012,085	156,347,182	+10,323,012
Netherlands	89,386,676	15,852,624	105,239,300	+73,534,052
Belgium	48,307,011	12,940,806	61,247,817	+35,366,205
Italy	33,256,620	27,924,176	61,180,796	+5,332,444
British North America	95,319,970	39,369,074	134,689,044	+55,950,896
Mexico	34,974,961	28,646,053	63,621,014	+6,328,908
West Indies	47,436,677	52,125,379	99,562,056	−4,688,702
Brazil	11,578,119	58,073,457	69,651,576	−46,495,338
China	15,625,679	26,901,762	42,527,441	−11,276,083
British East Indies	4,892,323	45,355,976	50,248,299	−40,463,653
Japan	29,087,475	32,748,902	61,836,377	−3,661,427
All others	180,115,040	180,033,789	360,148,829	+81,251
Totals	$1,394,483,082	$849,941,184	$2,244,424,266	+$544,541,898
Grand divisions.				
Europe	$1,040,167,763	$440,567,314	$1,480,735,077	+$599,600,449
N. America	187,594,625	130,035,221	317,629,846	+57,559,404
S. America	38,945,763	93,666,774	132,612,537	−54,721,011
Asia	64,913,807	139,842,330	204,756,137	−74,928,523
Oceanica	43,391,275	34,611,108	78,002,383	+8,780,167
Africa	19,469,849	11,218,437	30,688,286	+8,251,412

This shows an increase in total commerce of $515,027,260, and of excess of exports of $504,977,284 over 1891.

ARTHUR T. HADLEY.

Commerce: a game played with cards and counters; of the latter, each player puts an equal stake into the pool. The dealer is called the banker, gives each player three cards, and then inquires, *Who will trade?* The eldest hand can either *barter* or *trade for money*. Barter means the exchange of a card with the right-hand player, and can not be refused unless the right-hand player declines the exchange. To *trade for money* is to forfeit a counter to the pool for the privilege of exchanging a card for one in the stock or pack. When the trading and bartering is completed, three like cards are reckoned as a *tricon*, and the best tricon wins the pool. If there is *no* tricon, the best sequence of three cards in the same suit will win; and if there is no sequence, the best *point* takes the pool; that is, the three cards having the smallest number of pips—aces reckoned as 11, and court-cards as 10—but the rules vary among different sets of players.

Commercial Agencies: See MERCANTILE AGENCIES.

Commercial Crises: periods of depression in trade. Every line of business is subject to seasons of prosperity and adversity. As industry makes progress, and its different branches become more and more dependent on one another, we have recurring seasons of general prosperity and general adversity, which affect nearly all forms of industry to a greater or less degree. First, we find a period of speculation, in which every business man strives to extend his operations. Prices are rising, prosperity seems to be increasing, wages are high, and employment steady. Then comes a shock to credit at some weak point in the industrial system; confidence is destroyed, prices begin to fall, business men contract their operations, wages are reduced, and working time reduced still more. General adversity for merchants, capitalists, and laborers alike succeeds the general prosperity of the former period. To this condition of things the name commercial crisis is applied.

Crises are often confounded with panics. There is almost always a connection between the two; but a crisis really means something much wider and longer than a panic. A panic starts among a group of speculators—perhaps in Wall Street, perhaps in the Chicago Produce Exchange, perhaps in the London money market. There are many failures, with much forced liquidation; but when the liquidation is accomplished the matter may be soon over. The panic is purely financial; the crisis which may follow is industrial. It affects not merely the speculators, but the producers; not merely the dealers in securities, but the laborers; not merely the bankers, but the community as a whole. Panics are

possible under any system, but the chance for crises, affecting all industry for such a long time, is peculiar to modern industry, and forms perhaps the gravest charge which the socialists can make against the existing industrial system.

The first crisis of the modern type occurred in 1720. It developed in France and Great Britain almost simultaneously. In the year 1716 John Law, a native of Edinburgh, under the authority of the French monarchy, founded a bank whose operations were extremely successful. Not satisfied with this success he soon afterward developed his Mississippi scheme, first known as the Western Company. Actual operations began in 1718; in 1719 it was in possession of twenty-one ships and nearly a million of dollars of money and goods. All sorts of financial operations were intrusted to it by the Government. The shares went up to many times their original value. A fever of speculation set in which lasted until the beginning of 1720. Then there was a sudden collapse and an overwhelming reaction. About the same time similar speculation was carried on in Great Britain, not by a single company, but by a large number of companies, known as "bubbles," the largest being the "South Sea Bubble." There was no currency inflation in Great Britain, as there was in France; but except in this respect the speculative fever was wilder and the reaction equally widespread.

There were commercial crises of less importance in 1763 and 1799 in Hamburg, and there were inflation and depression in connection with the currency of the French Revolution, but no general crisis until after the close of the Napoleonic wars. During the reign of Napoleon the continental ports had been closed to English manufactures. Great Britain at once took advantage of the peace of 1815 to make up for lost time. It flooded the Continent with British goods, and made arrangements to produce such goods for the continental market on a scale which could not possibly be maintained. The reaction was terrible. The cessation of the demand for British manufactures threw large numbers of men out of employment. Another crisis developed about ten years later. In 1824 and 1825 speculative companies were formed and speculative loans placed in the London market to an amount for which the bubbles of 1720 alone furnish a parallel. At the end of 1825 the unsoundness of these speculations had begun to show itself. A few failures were sufficient to destroy all credit. Only by most radical measures was the Bank of England enabled to give enough support to the business community to prevent general suspension of payments.

The last-named crises were peculiar to Great Britain. That of 1836, with its consequences, was shared by the U. S. also. In fact it may be said to have been primarily a U. S. crisis. It had two distinct sets of causes, one financial, the other industrial. The financial causes are to be found in the unsound organization of banks in different parts of the country, not excluding the U. S. Bank itself. The industrial causes were to be found partly in the overproduction of cotton on a credit basis, partly in the system of internal improvements which had locked up much capital in works which were not productive, some on account of their incompleteness, some on account of their inherent worthlessness. As long as the speculative fever lasted the unsound concerns were able to support one another, but with the failure of a few the whole commercial fabric went to pieces. A crisis which took place in 1837 seemed for the moment to be checked by bold financiering and by the hopeful spirit of the people, but it recurred in equally disastrous form in 1839, and this time it seemed impossible to stem the disaster or to recover from its consequences. The British crisis of 1836–39 was much slighter than that in the U. S., and was chiefly notable for the reform in the British currency system whereby the danger of inflation was done away with.

The next crisis of importance was that of 1847 in the British islands. Although railroads had been invented as early as 1830, it was not until 1845 that railroad operations were developed on a large scale. In that year and the two years following the amount of railroad construction in Great Britain was enormous. Unnecessary roads were brought into operation, while other roads were chartered and begun which could not be put on a paying basis for some time to come. The mania for railroad-building in Great Britain was worse than that for internal improvements in the U. S. ten years earlier, and the reaction in 1847 even sharper and more widespread, though not of such long duration.

In the year 1857 there was a general crisis that affected the financial world as a whole and not any one or two particular countries. The discovery of gold in California in 1849 had started a fever of speculation which culminated in 1856. The Crimean war, producing an artificial demand for special supplies, had tended to increase this speculation. France had become deeply involved in the tide. The Crédit Foncier, the Crédit Agricole, and the Crédit Mobilier encouraged the investment of capital in all possible lines of productive industry. Germany followed suit, and attempts at restriction of bank-note issues by the Prussian Government seemed of little avail. Railroads were built in Prussia and in Austria on a large scale. British industry felt the force of foreign speculation. In the U. S. matters went quite as far as on the continent of Europe, and further than in Great Britain. Railroads were extended from the seaboard to the lakes and the Mississippi. The policy of land grants caused unnatural development of certain sections of the West and South with greater rapidity than would have been caused by the legitimate demands of trade. Meantime the bank reserves began to fall, while the liabilities were constantly rising. On Aug. 22, 1857, the loans of the New York banks were $120,000,000, their coin reserves but $10,000,000, their circulation less than $9,000,000, their deposits but $89,000,000. Such a state of things could not continue. Yet the banking conditions in New York were far better than in any other part of the country. So loose were the State bank laws of the time that "wild-cat" notes without any proper specie reserve formed a constant menace to commercial credit. When speculation failed at any point the banks were useless; when the banks were useless the means of payment failed at all points. The failure of the Ohio Life and Trust Company on Aug. 24 began the difficulty. Other failures followed. On Sept. 30 109 large houses had failed, forty banks were ruined, and many more were in such straits as to be of no service in helping their customers. On Oct. 13 the crisis culminated in New York city. The suspension of payments followed on the 14th. Two months more and the large railroad and industrial companies were failing to meet their interest obligations. Prices fell ruinously, cotton dropping from sixteen cents a pound to nine cents. In New York alone 30,000 laborers were out of employment. Nor could Great Britain remain untouched by such a disaster, loaded as were some of the British financiers with American investments. Early in November several important failures took place. On the 9th the largest Scotch bank suspended payments, and this was followed by a general run on Scotch banks as a whole. The resources of the Bank of England were inadequate to stem the tide. On Nov. 11 the reserves had fallen to $7,000,000. On Nov. 12 the Bank Act was suspended and the directors given authority to issue notes in violation of the provisions of the act of 1844. This checked financial panic, but did not prevent the industrial crisis that followed, with the inevitable result of throwing large numbers of laborers out of employment. The same conditions ensued in Germany, in Austria, and in fact almost all over the Continent; nor did anything like thorough recovery take place until after the close of the civil war in the U. S.

There was a crisis in 1866 in London, and on Sept. 23, 1869 (Black Friday), in New York; but each of these was a financial panic rather than an industrial one, and was strictly localized in its effect, the latter especially being connected with gold speculation. The crisis of 1873, on the other hand, was industrial rather than financial, and was, on the whole, the severest and most general one through which the world has passed. From 1869 to 1873 there was an enormous amount of investment of capital in machinery and transportation agencies. Several causes combined to produce this effect. The opening of the Suez Canal had given a great stimulus to trade. The substitution of steel rails for iron had created possibilities of cheap and profitable railroad transportation undreamed of ten years before. This cheap transportation facilitated the interchange of manufactured goods with farm produce, and rendered the concentration of manufacturing capital and the consequent economy in production easier than ever before. It also made it possible to develop new land which was previously out of reach of any market. This was an important factor in the growth of the West, a growth which was stimulated by the renewal of the land-grant policy already described. Taking all these things together, we find unprecedented building of new railroads, new factories, and new ships, and side by side with it a development of new land on a wider scale than ever before. Much of this was done with bor-

rowed capital, a rate of interest being fixed on the basis of the high prices which prevailed in 1870, 1871, and 1872. As long as these high prices continued all went well, but by the year 1872 capital had been duplicated to such an extent that it was no longer possible for all the products to be sold at the old prices. First in manufactures, then in railways, then in farm products, there was a decided fall. The beginning of this fall occurred in the latter part of 1873. On Sept. 18 the great banking-house of Jay Cooke & Co., in New York, failed, and this brought trouble to the house of Fisk & Hatch and to the London house of McCulloch, with which it was connected. Involved as the whole financial world was in unsound speculation, this meant disaster everywhere. It was not so sudden as the crisis of 1857, because the banking system was better, especially in the U. S., but the results were even more lasting. The short-time loans were better covered in 1873 than they had been sixteen years before, but not the mortgages and other long-time loans. Capital had been borrowed for investment on false estimates of land value. The year 1874, as far as general industrial condition was concerned, was worse than in 1873, and 1875, 1876, and 1877 involved still greater distress in Europe and America alike. The trouble was intensified by unwise legislation in various forms, and perhaps showed itself at its worst in the middle of 1877, at the time of the great railroad strikes. After this there was a slight improvement, slow in 1878, very much more rapid after the resumption of specie payments in 1879.

The years 1879, 1880, and 1881 formed a time of active but, on the whole, sound speculation. People had not wholly forgotten the lessons of the crisis of 1873. Land was mostly held at a moderate valuation. Much capital was borrowed, but the security for such loans was better and the rate of interest lower than it had been the ten years before. But in 1882 railroad-building was carried to such a point that it was impossible for the business of the country as it then stood to pay interest on the investments, and with this excessive railroad-building there was an excessive demand for iron and coal which could be only temporary. At the close of 1882 clear-headed people feared a repetition of the experience of 1873. These fears did much to prevent the recurrence of the danger in the form which it took ten years previous. Although a financial panic occurred in May, 1884, it was a comparatively slight one, but there was a period of industrial depression, intensified and prolonged by the unwise action of certain labor organizations in 1885 and 1886.

Toward the close of 1886 confidence was restored—in certain lines too much restored—for the railway-builders repeated the mistakes of 1882, and paved the way for adverse legislation in 1887–88 and for a depression in railway securities.

Europe was somewhat affected by the depression of 1884–85, but not at all by that of 1888, which was in its nature local and partial. The European markets were far more disturbed at the end of 1890 by the failure of a series of speculations in which the U. S. had taken little or no part. European houses had invested largely in African and in Argentine securities. The financial movements in the Argentine Republic in 1889 were closely parallel to those in the U. S. in 1856 or 1872, but in some respects even worse, and the reaction was correspondingly severe. Meantime French houses had been speculating in copper on a large scale. The failure of the copper syndicate, coupled with the collapse of Argentine credit immediately following, involved leading bankers both on the Continent and in England in difficulty. Public confidence was shocked beyond measure by the suspension of payment of Baring Brothers, a house whose name had for generations stood perhaps higher than any other private concern. The industrial crisis did not at first appear to be proportionate to the financial danger, but the resulting depression, though not acute, has been widespread and lasting.

Such is the history and general character of commercial crises. It remains to examine the theories which have been urged as explanations.

An ingenious but unsound one is the *sun-spot* theory. It was observed that there were crises of more or less severity in 1815, 1825, 1836, 1847, and 1857, periods of about ten or eleven years elapsing between each successive crisis. Now it happens that sun spots attain a maximum once every ten and a half years, and it occurred to certain ingenious observers that these sun spots probably had an effect on the harvest, producing prosperity at one time and depression at another. This theory was defective in several points: first, it could not be proved that there was any possible connection between sun spots and good or bad harvests; second, commercial crises sometimes occurred just after a good harvest and sometimes just after a bad one; finally, the civil war in the U. S. quite broke up the regular ten-year round of crises, and, as it did not have any appreciable effect on the sun spots, it may be said to have broken up the theory also.

The second theory, and a better one, is that of *misdirected production*. The advocates of this theory say that a commercial crisis is due to the investment of unnecessary capital in wrong lines of industry. They deny the possibility of general overproduction, or anything like it. They say that the so-called general overproduction is really local or partial overproduction, and means underproduction elsewhere. There is a special demand for particular lines of manufactured goods or for the development of internal improvements in certain localities. Capitalists rush to take advantage of the special opportunity for profit and overdo the matter, investing twice as much capital as is necessary and contracting large obligations in connection with such investment. This capital, once invested, can not be withdrawn, nor can it be profitably transferred to any other line than the one originally proposed. Naturally, however, the overproduction of particular lines of goods or the overdevelopment of particular localities brings its reaction. The expected prices can not be realized; the obligations can not be met. Producers and banking-houses alike suffer severely from the misjudgment of investors, and such suffering must continue until a part of the misapplied capital is worn out, or until the needs of the country grow up to the volume of capital invested. This theory is true in a great many particulars, but it fails to take account of two sets of facts. In the first place, the commercial crisis, instead of being local or partial, applies, to a greater or less extent, to all lines of industry. Under the theory just outlined, if manufactures become unprofitable, we should expect to find farmers rejoicing in being able to sell their goods to advantage and buy those things that they wish cheaper than before. But, in point of fact, the farmers suffer at the same time with the manufacturers. We also find that the financial disaster, instead of being a result of the fall in prices of certain goods, usually precedes it—that credit collapses first and production suffers afterward; whereas the misdirected production theory would put these events in the opposite order.

The true explanation can be understood only by a knowledge of the existing credit system. Suppose a merchant wishes to extend his business. Does he borrow the cash to do it? Not generally. He goes to a bank to get his bills discounted. If A has sold goods to B, an agreement to pay this bill at some time in the near future serves as a basis on which A can increase his line of bank deposits, and can draw more checks than would otherwise be possible. As long as A and B are both good, and as long as the bill represents an actual transaction, the bank will be glad to discount such paper. On the line of deposits thus created a large proportion of the expanding business is based. These bank deposits are for many purposes the chief currency of the country. The large business payments are made by check and not by cash. The amount of such checks that can be drawn is based on the amount of the deposits in the bank. The amount of deposits in the bank depends in considerable measure upon the amount of accepted bills. If prices, for any reason, begin to go up, this fact increases the size of the bills and creates an increased line of deposits, particularly as the banks are readier to furnish accommodation on a rising market than on a falling one. But this increase of checks tends in its turn again to increase prices; and thus matters go on, higher prices producing more deposits, more deposits involving more checks, more checks acting as a virtual inflation of the currency and producing still higher prices. But this can not continue indefinitely. By and by the deposits of the bank increase out of proportion to their coin reserve. Such operations must be contracted. This contraction of bank accommodation, like a contraction of the currency, begins to produce a fall in prices. As prices fall it is harder to get bills discounted. This increased difficulty of obtaining accommodation increases the contraction and lowers the price still further. Men who incurred obligations on the basis of inflated prices now find themselves unable to meet those obligations, even though their business has remained the same.

The contraction thus described may be either sudden or gradual. If there is a panic, as in 1857, it will be sudden. If there is no panic, as in 1884, it will be gradual. But in any event the effect is the same. Producers who have borrowed money and used it in making investments which can only be profitable on a high-price level now find themselves forced to sell the goods at a sacrifice. More than that, they must in some measure contract their operations, reducing their wages and their working time, and spreading the distress from purely financial circles to the community as a whole. Business is done with capital borrowed at rates based on temporary high prices. If there is a general fall in prices, all business is liable to suffer. The credit system is an exceedingly delicate means of getting goods into the right hands. A general failure of credit renders such a result impossible, and may create all the appearances of general overproduction, whether we call it by that name or not, simply because the product can not be put into the places where it is needed. Every producer finds it hard to sell his goods; if his financial solvency depends upon selling them at a remunerative price, he goes under, and some one else takes his place.

As long as any one who can save or borrow capital is given the right to control industry, it will be impossible wholly to prevent this state of things. Some conditions, however, may increase the danger, while others tend to diminish it. A country with a metallic currency, accepted all over the world, is very much less liable to such dangers than a country with a paper currency which may be inflated, or even with a metallic currency which other nations are unwilling to accept in payment of debts. Again, laws may be so framed as to encourage the borrowing of capital on insufficient security by giving every facility to reckless speculators to manage unsound enterprises and then escape liability; or they may be so framed as to hold all such speculators responsible for damages, and liable in cases of fraud to actual imprisonment. The U. S. is behind most other civilized nations in this respect, especially in the matter of the personal liability of directors, which is much greater both in Great Britain and in Germany. Such liability does not seriously interfere with honest enterprises, and it prevents many of the dishonest ones, which do the most harm.

Socialists claim that crises are a result of individual business activity, and would be averted in a large measure if the conduct of industry were intrusted to the hands of government. They say, with some plausibility, that it would be better to decide where and how capital should be invested on the basis of industrial statistics instead of taking the chance of individual gain with great possible loss to the community. To this view it may be answered that no government has been found wise enough to conduct affairs of this kind on the scale proposed, and that the few experiments of the sort, like that in Paris in the revolution of 1848, have indicated that such action would produce more trouble than it would avert. While private industry *may* produce goods that are not needed, government industry, under the direction of a socialistic authority, is almost sure to do so. Whether government action in these matters is to be increased or diminished, the remedy must be sought in higher education of the business instincts of the community. If the community can not look five years ahead, it will be liable to the results of miscalculation, whether its business be managed by private individuals or by government. If the community can look five years ahead, it will be comparatively free from these evils. Whether individuals or governments are to be intrusted with this work of prevention depends chiefly on the question whether individual capitalists or government officials are likely to possess this business intelligence and foresight in the higher degree.

See Hyndman's *Commercial Crises of the Nineteenth Century*. D. A. Wells's *Recent Economic Changes* may also be consulted with advantage on some points. See Banks, Currency, and Political Economy.

A. T. Hadley.

Commere, kō′mār′, Léon François: genre and portrait painter; b. at Trélon, Nord, France, Oct. 10, 1850. Pupil of Cabanel; Grand Prix de Rome 1875; second-class medal, Salon, 1881; Legion of Honor 1885. He is a very able technician. His *A Star* (1882), a portrait of a ballet-dancer, is owned in the U. S. and is a brilliant piece of painting. Studio in Paris. W. A. C.

Commerson, kom′mār′sōn′, Philibert: French botanist; b. at Châtillon-les-Dombes, Nov. 18, 1727. He accompanied as naturalist the expedition of Bougainville, which sailed in 1767, and he visited South America and explored Madagascar, etc. He died in 1773, leaving some works in manuscript. He was elected a member of the French Academy in 1773. *Commersonia*, a genus belonging to the family *Sterculiaceæ*, commemorates his name.

Revised by Charles E. Bessey.

Commination [from Lat. deriv. of *commina're*, threaten, because in it God's threatenings against sin are repeated]: a penitential service in the Liturgy of the Church of England. In that of the American Episcopal Church the greater part of this service was omitted at the revision of 1789. In the new *Standard* of 1892 portions of this ancient office have been restored, with the title *A Penitential Office for Ash-Wednesday*, and are placed in the Prayer-book after the special *Prayers* and *Thanksgivings* following the *Litany*. The commination in the English Book of Common Prayer comes with little change from the old missals of Sarum and York. The Greek and Latin Churches retain the commination, but only for Ash-Wednesday. The commination is in substance a repetition of the curses found in Deut. xxvii., and at the reading of each sentence the congregation responds *Amen*. It is read in the English Church upon Ash-Wednesday, and upon such other days as the ordinary shall direct. Its use is traced back to about 700 A. D.

Revised by W. S. Perry.

Commines: See Comines.

Commire, kō′meer′, Jean: Jesuit teacher of theology and Latin poet; b. at Amboise, in France, Mar. 25, 1625; d. in Paris in 1702. He was remarkable for his frank and upright character and for spirituality. He is now remembered only for his Latin poems (*Poemata*, Paris, 1678; n. e. 1753, 2 vols.), which are mostly upon religious and moral themes, and are remarkable for elegance of diction rather than for power or originality. He produced some fine Latin fables in verse.

Commissariat [Fr., from *commissaire*, commissioner]: that department of the military administration which has in charge the furnishing of food, forage, clothing, camp-equipage, quarters, etc. In ancient Rome the quæstors attended to the victualing of the troops. In the U. S. these functions are divided between the subsistence department, which furnishes the food-supplies, and the quartermaster's department, which furnishes camp-equipage, quarters, etc. The first English commissary-generals were called proviant-masters. The British commissariat is now under the charge of the quartermaster-general. That of the U. S. at present is under an officer who has the rank of a brigadier-general and the title of commissary-general of subsistence.

Commissary (in Fr. *commissaire*): a term nearly synonymous with deputy, signifies one to whom the power and authority of another is committed. It is sometimes used in a sense nearly equivalent to that of commissioner. In the army the officers of the commissariat department are styled *commissaries of subsistence*. The officers having charge of musters in and out are *commissaries of musters*. In ecclesiastical law, a commissary is formally appointed by a bishop to exercise jurisdiction in his name or on his behalf. The bishops of London, in whose jurisdiction the North American colonies were before the Revolution, appointed commissaries in the various provinces who convened the clergy, adjudged causes referred to them for settlement, and administered discipline, subject of course to appeal.

A papal commissary is a bishop or other high functionary deputed to perform duties properly belonging to the pope. There are *temporary* commissaries appointed for the performance of a single act or a few particular acts; and *perpetual* commissaries, who regularly represent the pope or some superior prelate in a specified place or district. Often the duty of a commissary is performed by a board of officers, who together constitute a *commission*.

In Scotland the sheriff of each county is called also *commissary* of that county. When the Reformation drove the papal commissaries from Scotland, there was established a supreme commissary court in 1563 for administering the law in such cases as had been formerly decided by the ecclesiastical courts of the papal representatives. The commissary court gradually lost its powers, its duties being performed by the civil courts. In 1836 it was abolished; but there are still commissary courts for the counties presided

over by the sheriff. They transact some of the business which in the U. S. comes before the probate courts.

Commission: a written warrant of authority; an instrument issued by a government, as in letters patent, or by a court, clothing a person with authority to act in designated matters, usually of a public or quasi-public nature, or commanding the performance of certain duties. The term is also applied to persons jointly invested with an office or trust. The higher officers in the army and navy hold their authority by virtue of commissions, and are called *commissioned officers*. The lowest grade of commissioned officer in the British army is sub-lieutenant, that in the U. S. army is second lieutenant. The buying and selling of commissions under the rank of colonel formerly prevailed in the British army, but it was abolished by royal warrant, against the will of the House of Lords, in 1871. F. Sturges Allen.

Commission Agent: See the Appendix.

Commission Merchant: See Factor.

Commissionnaire [Fr.]: an attendant at European hotels, employed to attend at the arrival of railway trains and steamboats to secure customers, to take charge of baggage, see it passed by the custom-house officers, and send it on to the hotel. A corps of commissionnaires, consisting of retired soldiers and sailors, is in existence in the United Kingdom. It was founded in 1859 by Capt. Sir E. Walter, K. C. B., and consisted at first of men who had served in the Crimea or in the Indian mutiny. It numbers nearly 2,000, and has divisions in all the large cities and towns. It has recently (1896) extended its sphere to Australia and other British colonies. The men are employed in every capacity.

Commissioner: a person acting under a commission. Various State and U. S. officials are designated by this title, as the commissioner in lunacy in New York, the commissioner of pensions of the U. S., whose duty it is to attend to the execution of the pension and bounty-land laws, etc. The commissioner of patents of the U. S. is invested with large discretionary powers, and under the direction of the Secretary of the Interior superintends or performs all duties respecting the granting and issuing of patents directed by law, and has the charge of all books, records, papers, models, machines, and other things belonging to the Patent Office. He may establish, subject to the approval of the Secretary of the Interior, regulations not inconsistent with law for the conducting of proceedings in the Patent Office. The commissioners of the U. S. circuit courts are appointed to take bail and affidavits, also to take preliminary examination of persons charged with crime under the U. S. laws, and also of persons claimed for extradition, in doing which they sit as a court. F. Sturges Allen.

Commissioner of Assize: See the Appendix.

Com'missure [from Lat. *commissu'ra*, a joining together; *com*, together + *mittere*, send]: in anatomy, the union of any two parts or the structure which unites any two parts. Thus at the outer and inner angles of the eye there are *commissures* between the lids; and in fact the angles of the eye, the mouth, etc., are often spoken of as the commissures of the lids, the lips, etc. Among the parts named commissures are the following: the *commissura simplex*, a little lobe of the cerebellum situated near the posterior incisure, and forming a part of the superior vermiform process; the *commissura brevis*, a lobule arising from the inferior vermiform process of the cerebellum, within the posterior incisure; the *great commissure* of the brain, called often *corpus callosum*, which unites the hemispheres of the cerebrum; the *anterior*, *middle* or soft, and *posterior commissures* of the brain, bands which cross the cavity of the third ventricle; the *optic commissure*, or chiasma, the point of the decussation of the optic nerves.

Committee: in law, one or more persons to whom a matter has been intrusted for examination, supervision, or other action. The term is especially applied to a person appointed by a court to take charge of the person or the estate, or both, of a lunatic, spendthrift, or habitual drunkard. The committee of the person corresponds to the "tutor," and the committee of the estate to the curator of the civil law. Contrary to the ancient custom the next of kin is now favored for committee of the person, and the heir-at-law for the committee of the estate. F. Sturges Allen.

Commodia'nus: a Christian Latin poet of the middle of the third century A. D.; commonly called a native of Gaza, in Syria, but he was probably an African. His language is very faulty, and his hexameters curiously irregular, being based partly upon quantity, partly upon accent. He shows also a fondness for acrostics and telestichs. His two works are entitled *Carmen Apologeticum adversus Judaeos et Gentes* and *Instructiones per litteras versuum primas*. The latter is found in Migne, vol. iii., pp. 202–262; best complete edition by Dombart (Vienna, 1887); English prose translation of the *Instructions* in *Ante-Nicene Fathers* (New York, vol. iv., 203–18). M. W.

Commodore: formerly a courtesy title given in the U. S. navy to the senior officer of a squadron; in 1857 the title flag-officer was substituted by act of Congress. In 1862 commodore was established as the grade next above that of captain, and made to rank with brigadier-general in the army. The grade of commodore in the active list was abolished by act of Congress in 1899. In the English navy the title is one of courtesy only given to the senior captain of a squadron when no admiral is present, or to the captain commanding a naval station abroad, as at Hongkong. A commodore when in command afloat flies a broad pennant. The title is one much affected by yacht clubs. Revised by C. Belknap.

Com'modus, Lucius Ælius Aurelius: Roman emperor; b. in 161 A. D.; the son of Marcus Aurelius; succeeded his father in 180, and soon manifested the excessive cruelty and sensuality of his disposition. His mistress Marcia, who had found her name marked down in his tablets for death, conspired with two of his officers, Eclectus and Lætus, and caused him to be strangled in 192.

Common: See Hereditaments, Incorporeal.

Common Carriers: See Carriers, Common.

Common Council: a name given in some cities of the U. S. to one of the governing bodies which control the municipal and local affairs.

Commoner: one of the common people, applied in general to all persons except the hereditary nobility; also a student of the second rank in the University of Oxford (England), who pays for his board or *commons* and other charges. The term "great commoner" has been applied to the English patriot Hampden, and to the elder William Pitt before he entered the House of Peers.

Common Law: that body of English law which does not rest for its authority upon any express and positive declaration of the will of the Legislature. It is opposed to written or statute law. In the several States of the U. S. the term common law means both the common law of England and the statutes passed by the English Parliament before the emigration of the first settlers to America. The common law constitutes the basis of the jurisprudence of all the States of the U. S., with the exception of Louisiana, in so far as it conforms to the circumstances and institutions of the country, and has not been otherwise modified by statutory provision. It is presumed to exist in the original colonial States and in States the population of which has been formed by emigration from the original States.
Henry Wade Rogers.

Common Pleas, Court of: See Courts.

Common Prayer, Book of: a collection of all the forms of worship used in the Church of England. The King's Primer, published by Henry VIII. in 1546, was the first form of this book, but it contained only the Creed, Lord's Prayer, Commandments, and Litany. Edward VI. had this primer twice revised and republished (in 1549 and 1552), and his second Liturgy is very similar to that which now exists. He caused the Sentences, Exhortation, and Confession and Absolution to be prefixed to the Daily Service, and introduced the Decalogue into the Communion Service (1548). In the reign of Elizabeth the Liturgy was again revised (1559), but with few alterations. After the conference with the Presbyterians at Hampton Court, James I. instituted another revision, and added the explanation of the sacraments in the Catechism (1604). It was again revised under Charles I. (1633). After the restoration of Charles II., when a conference had been held with the Dissenters at the Savoy, the Common Prayer-book was further revised in 1662. Certain forms were added, and slight changes were made in the services; and a very few have been made since that time. In the American Episcopal Church a revision of the English Prayer-book was rendered necessary by the necessity for the omission of the "State Prayers." Other changes were suggested, and what is known as the *Proposed Book* was published in 1786 (reprinted in England

1789, and again in Hall's *Reliquiæ Liturgicæ*, and again as the *Bishop Cummins Prayer-book of the Reformed Episcopal Church*). This compilation was chiefly the work of the Rev. Dr. William Smith, formerly provost of the College and Academy of Philadelphia (now the University of Pennsylvania). This failed of general acceptance. A return to the English book, with certain necessary modifications, was set forth in 1789, which has been superseded by the present *Standard* issued in 1892, and more closely conforming to the English book than its predecessor. The standard histories of the Prayer-book are by F. Procter (London, 1855; 18th ed. 1889) and W. G. Humphrey (London, 1853; 6th ed. 1892). Revised by W. S. Perry.

Common Schools: schools in which the common or elementary branches are taught. In the U. S. the term common schools means schools for the common people, directed and supported by the people themselves, and the term is used in that sense in this article when treating of education in the U. S.

Common Schools before the Reformation.—In the despotic civilizations of the East education was universally controlled by the Church, confined to special classes, and paid for by the recipients. The political and religious organizations were such as could only exist if supported by the ignorance of the masses.

In Greece, all the Spartan children were trained physically, and taught the severe virtues of the time under the direction of the state, but the individual had to meet the expense. In Athens, the state cared for physical training, and to some extent supervised the training of intellect and morals.

In Rome education was largely military and religious, and such schools as existed were private, and dominated by religion rather than by the state.

Throughout the Middle Ages, the state rarely interested itself in education. Such schools as existed were established and maintained by the Church. The troubles of the times, however, and the opposition to any free thought discouraged intellectual activity. The schools of Charlemagne and Alfred were but spasmodic attempts, and did not affect the masses of the people directly. Not until the beginning of the twelfth century did any considerable interest in learning appear, and then it was confined to the higher institutions of learning. Universities sprang up, but common schools were not started.

The Reformation.—Schools of the people, for the people, and directed by the people, began four centuries later, under the influence of the Reformation. The new faith preached by Luther was not only favorable to common schools, but it could be realized only through common schools. If individuals are to be personally responsible for their beliefs, and if those beliefs are to be based on a personal study of a great mass of writings, then each individual must be taught to read and to express himself, and he must be given a trained judgment. From the days of Luther, the Church has been compelled to found and support common schools. All the other great movements of the early sixteenth century greatly strengthened this new interest in public education. The discovery of printing and of cheap paper, the broadening of knowledge through voyages, the study of the classics, and the development of new arts and industries, all greatly aided the movement toward common education.

In Germany.—In Germany, one would naturally expect the most rapid development of schools after the Reformation. Luther vigorously favored schools for the people, and a number of famous teachers arose. But the schools they established were mainly confined to the cities. The Thirty Years' war destroyed nearly all the German schools, and left Germany in 1648 almost a desert. Schools began to grow up a few years later, and they, like the manners of the time, were formed after French models. In 1713 a general school-law for the Prussian monarchy was passed. In 1763 Frederick the Great promulgated a code making attendance compulsory, and establishing the leading features of later school-laws in Prussia. The Church authorities were to retain supervision of the schools.

The modern system of German common schools dates back to the terrible disasters which brought Prussia to the brink of national extermination. After the treaty of Tilsit, which marks her lowest estate during the Napoleonic wars, Prussian patriots turned their thoughts toward an intellectual and moral regeneration of their people, and naturally turned to the public school as one of the most powerful aids they could command. National education became a distinct and important branch of the administration of the state, and under the direction of such men as Stein and Humboldt new ideas were introduced, largely Pestalozzian, and the schools of Prussia became the educational models for the world.

In France.—In France, as in Germany, the Reformation encouraged popular education, and the Huguenots established a large number of elementary schools, mainly for religious instruction. To oppose these Protestant tendencies, the older Church established schools, especially in the provinces most tainted with heresy. There was, however, no general system adopted by either Church. After the Revocation of the Edict of Nantes, which in 1685 drove the most intelligent part of the middle class out of France, the constant decline in revenue made any considerable government aid to education impossible. The Revolution, from the first, declared itself in favor of general education. Various measures were proposed, but none was carried out until the consulate. Public primary schools under the direction of the state were first established in 1833, under the direction of M. Guizot, Minister of Public Instruction.

After the terrible disasters of 1870, France turned her attention to her public schools, as the only means of rehabilitating the country. She studied the German and Dutch schools, and within twenty years made her elementary schools second to none in Europe. They are under the direction of a Minister of Public Instruction and Fine Arts, who exercises very large directive powers. Inspection is in the hands of Government officials, who inspect even private schools and home instruction. Instruction is free, and attendance is obligatory.

In Scotland.—Superior schools for the common people seem to have existed in Scotland before the Reformation. From the first the Reformed Churches took the schools under their charge, and tried to make elementary education universal. In 1696 a statute was passed under which common schools were generally established. They were supported by local effort and directed by the clergy. In 1861 the schools were in some degree freed from the Church and made more dependent on the state and the universities. From the first the schools had been truly national; a conscience clause protected the rights of Roman Catholics, and all classes attended the schools. In addition to parish schools there were what we should call high schools, that were a part of the general system. In 1872 a new school law was passed in Scotland by which schools were still further secularized, and attendance was made compulsory and funds were supplied by national grants, by local taxes, and by school fees. In 1883 the compulsory laws were strengthened.

In England.—In England no such interest was manifested in common schools. Both the form of the Government and the form of the Church were opposed to a general education of the masses.

During the Reformation 250 grammar schools were founded for the boys of the middle classes. These schools were well endowed and cheap, but they were not "common" schools, as the term is used in the U. S., though they are called common schools in England. In some parishes the Church established schools, but these were uncertain and poor. Not until the close of the eighteenth century, under the influence of Bell and Lancaster, was any considerable interest shown. The Dissenters, following Lancaster, established the British and Foreign School Society; the established Church, following Bell, established the National Society. These two bodies controlled and for the most part supported such schools for the people as existed in England down to 1832. They drew revenue from voluntary contributions and from tuition. Several attempts to obtain aid from the state were made by Mr. Whitbread in 1807, and by Mr. Brougham in 1816–20, but the jealousy of the Churches made state assistance impossible.

In 1832, acting on its own responsibility, the Government granted £20,000 to aid education, and it was divided between the societies already mentioned. In 1839 the grant was increased to £30,000, and a special department was created to supervise the work, but it could act only through the two religious societies. An inspector of schools was appointed, but he could only see that the money was fairly spent.

Various measures were brought forward in Parliament from 1840 to 1870 looking toward state control of common education. It was proposed to establish schools for poor factory operators, to raise a local tax in aid of the schools, to pass a conscience clause excusing children from attendance

at religious exercises of which the parents did not approve. All these measures were lost. Meantime the treasury, through the educational department, which had no existence in law, was disbursing constantly increasing annual grants through the two great religious societies. In 1861 this department adopted a revised code, determining the conditions under which public money should be granted. They demanded approved premises, certificated teachers, a considerable attendance, and an examination of results.

In 1870 the Government first passed a law by which it actually took charge of certain lines of the common school work. School districts were organized, schools were increased, children were freed from attendance at religious teaching, all schools were inspected and directed by Government inspectors. The work was still, however, under the immediate direction of the great religious societies, where they had schools organized or where they wished to organize them. Where the Church did not act local school boards were established. A public school fund was provided, and school boards could, under certain restrictions, compel attendance. In the next six years accommodations were nearly doubled, and the quality of work greatly improved.

In 1876 an act of Parliament declared it to be the duty of every parent to educate his child, and regulated in some degree the school attendance. In 1880 a compulsory attendance law was passed.

From 1870 to 1891 the average daily attendance increased from 1,152,389 to 3,754,493, and the number of teachers from 30,130 to 105,148. In 1891 an act was passed making elementary education practically free in England and Wales; but three-quarters of the schools still remain under the direction of voluntary societies.

In the United States.—Whether the fundamental ideas embodied in the common-school system of the U. S. originated in England or in Holland is a question involved in too much controversy to be taken up here. Certain it is that all the early settlers who were driven to North America by persecution turned instinctively to the school as a means of perpetuating their religious views and maintaining their liberties.

Puritans in New England, Dutch in New York, Swedes in Delaware, Germans in Pennsylvania, and Huguenots and Scotch-Irish in all colonies made great sacrifices to secure education for the young. At first all the schools were connected with the Church, but as Government became secularized the schools followed the Government.

From 1635 schools existed in New England, intended for common people, partly supported by public funds, and under public supervision. The legislation of 1642 recognized the right of Government to demand that its citizens be educated. In 1647 Massachusetts passed an act requiring all townships having fifty householders to establish schools under a certain forfeit, which was increased by subsequent legislation. In 1650 Connecticut passed a similar law. Both of these laws required the establishment of a grammar school in larger towns.

It is claimed that in New York, under the Dutch, schools were so common that in 1664 nearly every town had its school, but it is certain that after the English occupation the schools of New York were inferior to those of New England. In Pennsylvania, while schools were favored by Penn and by the Germans, they did not flourish as in New England. Throughout the South the scattered life on plantations and the social customs of the time did not favor common schools. Instruction was mainly private.

During the whole colonial period common school instruction was meager, books were few, teachers were poorly prepared, and the payment of school fees kept the poor away from the schools or raised unfortunate distinctions between pay and pauper scholars.

During the long period of the Revolutionary war, from 1775–83 and down to 1815, the resources of the States were too heavily strained to admit of any considerable extension of the common schools. With the close of that struggle the strength of the nation was thrown into industrial lines—repairing the ravages of war, settling the lands over the Alleghanies, developing agriculture, commerce, and manufactures. Some advance had, however, been made during this long period. In many places schools had been established for girls, though seldom on a basis of equality with boys, some experiments had been made in school supervision, high or grammar schools had been established, and funds had been set aside for the support of schools.

By 1820 the industrial problems were so well in hand that attention could be turned to other things, and during the next decade there was a revival of learning marked by educational discussions in the press, in legislative halls, and in city councils; by improved organization of city schools; by the establishment or revision of the public school system in a majority of the States; by experiments in infant schools and manual training schools; by the establishment of mechanics' institutes, lyceums, and teachers' conventions; and by the broadening of programmes so as to include more science.

The growth from this period has been steady and most rapid. Since the civil war the South has developed her schools with a rapidity very remarkable, when one considers the destitution in which these States were left.

Present Systems in the United States.—There are at present in the U. S. as many systems as there are States. The national Government collects and distributes information through the bureau of education, cares for the military and naval instruction, controls the schools in the Territories and in the District of Columbia, and sometimes grants public lands to aid education in the various States. A strong effort has been made to use national funds for educational work in the South, but up to the present time it has been unsuccessful.

While each State has its own system of education, there is, nevertheless, a considerable uniformity. The schools in all the States are secular, and no religious instruction is allowed, though in most places the Bible is read at the beginning of the session and some special moral training is given. No exposition of the Bible is allowed and no religious formula can be taught.

The schools are all free, and the doctrine that all the property of the State should be taxed for educating all the children of the State is universally recognized. School money is drawn from permanent educational funds, derived originally from public lands or special State grants; from a State tax, disbursed on a basis of school population and school attendance; and from local school taxes.

The local unit for purposes of school administration is generally the township, but sometimes it is the county, or small school districts. The township system is most in favor, and seems destined to prevail. City schools are generally under a distinct city school administration.

Supervision is receiving constantly increasing attention. Each State has at its head a State superintendent of public instruction or a State board of education, sometimes both, and these officers have general supervision over its educational interests. Next below these officials come the county and city superintendents, who visit and criticise the schools and sometimes license teachers. Still below these come the trustees or township and district officials, who engage teachers, purchase school supplies, look after school buildings, and attend to the business details of the school-work.

Teachers are licensed by county or State examinations or by normal schools.

Most schools, except in some country districts, are classified. Children from six to ten form the primary classes, and those from ten to fourteen form the grammar grade. Above the grammar grade many cities and States provide high schools. These furnish an education adapted to scholars from fourteen to eighteen years of age.

Present Problems.—In the States thus hastily examined the movement has been steadily toward compulsory, free, secular education. In all of them these aims are realized in large measure. There are, however, many important questions now pressing upon the attention of the people of the U. S.

In some parts of the country large bodies of the citizens, believing that education should rest on a religious basis, are maintaining parochial schools in addition to the taxes they pay for the support of public free schools. They naturally demand that they be freed from school taxes unless a part of the taxes be devoted to the parochial schools. This question appears under many forms—centering about Bible-reading in the schools, use of particular text-books, and appointment of teachers.

Political interference, city normal schools, and the employment of special teachers for single subjects are some of the questions forcing themselves upon the attention of cities.

Methods of teaching are undergoing a very great change, under the influence of the better universities and the kindergartens. This change may be described by saying that the present aim of education is primarily to develop the powers

of the individual child, while the older education sought primarily to give information to a mass of children.

The high school is becoming more firmly fixed with every year as a part of the common school system, and in many of the cities the kindergarten school is being added.

One may say that the whole tendency is toward stronger State supervision. Text-books are regulated in most States, and in some they are published directly by the State. Cities seem inclined to place their schools under the direction of strong superintendents, and county and State superintendents are gradually being granted larger powers.

The curriculum has been steady. Elementary science has taken a most important place, and is even made the basis of much of the primary work. Physical training, manual training, cooking-schools, commercial courses, and courses in modern languages have been added to meet the demand for more practical results. This change has not been made without opposition, and the whole tendency toward introducing a larger range of elective studies is being seriously questioned by many educators.

The teaching force is steadily improving; normal schools are increasing, and courses for teachers are being added to colleges and universities. The teacher's remuneration is steadily rising, and a professional literature is growing up. Since 1840 women have gradually superseded male teachers in common schools, until to-day, in some cities and States, they practically have a monopoly. EARL BARNES.

Commons, House of: See PARLIAMENT.

Commonwealth: a state; a body politic; properly a free state; a republic. The official title of commonwealth is used by the States of Massachusetts, Kentucky, Pennsylvania, and Virginia.

Commonwealth of England: in history, the form of government established in England on the death of Charles I. in 1649, and which existed during the protectorate of Oliver Cromwell and his son Richard, until the restoration of Charles II. in 1660. The substitution of a democratic for a monarchial form of government was provided for and enjoined by two successive charters. The first charter of the commonwealth was drawn up in Dec., 1653; it was styled the "Instrument of Government." The second charter, called the "Petition and Advice," was framed in May, 1657. Under the first charter the English Government may be classed among republics, with a chief magistrate at its head; under the second it became substantially a monarchy, and Oliver Cromwell, from 1657 to the period of his death, was virtually monarch of England.

Commune of Paris: an organized band of socialists, outlaws, and *prolétaires*, connected with the International Association, who revolted against the new *régime* or Versailles government on Mar. 18, 1871. Paris had, a few days before this date, been evacuated by the Germans, who had taken it after a long siege. The National Guard of Paris had been permitted to retain their arms, and a large part of that guard supported the Commune, whose headquarters were in the quarters of Belleville and Montmartre. Among the prominent leaders of the Commune were Flourens, Félix Pyat, Assi, Delescluze, Paschal, Grousset, Gen. Cluseret, Dombrowski, Arnould, Jules Vallès, Blanqui, and Rochefort. Their principles and aims are thus defined by one who was a member of the Commune: "Their philosophy is atheism, materialism, the negation of all religion; their political programme is absolute individual liberty by means of the suppression of government, and the division of nationalities into communes more or less federated; their politieal ecomony consists essentially in the dispossession, with compensation, of the present holders of capital, and in assignment of the coin, land, etc., to associations of workmen."

As those members of the National Guard who favored the cause of order were irresolute and not inclined to fight, the Communists quickly became absolute masters of Paris. Their ranks were re-enforced by many convicts, whom they released from the prisons, and by many foreign refugees. The leaders who had some intelligence, some definite purpose, and some lingering scruples were soon discarded one after another and imprisoned, and the control of the Commune was obtained by desperadoes and outlaws, who initiated a reign of terror. On Mar. 26 an election was held in Paris to choose members of the Commune, but as the party of order declined to vote, only 180,000 votes were cast, and the election resulted in the triumph of the insurgents. The government organized at Versailles sent an army to suppress the insurrection. On Apr. 2 a large body of insurgents marched against Versailles, but they were repulsed at Meudon, and much injured by the fire of Fort Mont Valérien. The army of the republic began to besiege Paris under the command of Marshal MacMahon. The chief command of the besieged forces was held successively by Dombrowski, Cluseret, Rossel, and Delescluze. Violent dissensions disturbed the counsels and hindered the success of the Commune. On Apr. 5 they arrested Darboy, Archbishop of Paris, and other persons, whom they kept in prison as hostages. The insurgents, who occupied several forts in the environs, made an obstinate resistance to the besiegers. Having captured several of the forts, the besieging army, about 90,000 strong, entered Paris on May 22 by several gates, inclosing the insurgents in a great semicircle. The latter continued for five days fighting behind barricades in the streets, and revenged their defeat by atrocious acts of cruelty and vandalism. They set fire to the public buildings, and endeavored to destroy the ancient monuments and treasures of art. Among the finest edifices that were burned were the Tuileries, the Palais de Justice, the Palais Royal, and the Hôtel de Ville. The Louvre was partly consumed. During the last days of the power of the Commune they shot Archbishop Darboy, Bonjean, president of the court of cassation, and other persons whom they held as hostages. In order to execute their incendiary designs on a grand scale, they ignited petroleum, gunpowder, and other explosive materials in many parts of the city. Delescluze was killed while fighting in the street on May 26. The civil war ended on the 27th, when M. Thiers issued a bulletin stating that 25,000 Communists had been taken prisoners. Large numbers of these were put to death, and several thousand were punished with deportation. The ringleaders of the Commune who survived the battles were mostly captured and executed.

AUTHORITIES.—Sempronius, *Histoire de la Commune de Paris*; Beaumont-Vassey, *Histoire authentique de la Commune de Paris*; Moriac, *Paris sous la Commune*.

Revised by C. K. ADAMS.

Communica'tio Idiom'atum [Lat., conjoint possession of attributes; *idioma* = Gr. *ἴδίωμα*, peculiarity: deriv. of *ἴδιος*, peculiar]: the name marking the doctrine that the one person of Christ has conjoint possession of the attributes of the two natures—that the attributes of the two natures are so held together in the one person as *in it* to have fellowship with each other; the person which conjoins the nature conjoins their attributes in itself. The two natures are inseparable, both actively and passively. What is proper to either nature in the abstract belongs to Christ in the concrete; and what the divine, which is the assuming nature, has in itself, the human, which is the assumed nature, has in and through its personal conjunction with the divine. See Krauth's *Conservative Reformation* (476–481).

Communion Service: See EUCHARIST.

Communism: the theory which teaches that property should be held in common—a theory which Plato advocates in his *Republic*, and which was probably practiced before his time by the followers of Pythagoras. In later times the Neo-Platonist Plotinus attempted to establish community of goods upon the plan which had been proposed by Plato. Among the Jews the Essenes and Therapeutæ practiced a sort of communism. The so-called communism of the apostolic Church in Jerusalem lacked the essential features of communism. It was only partial and voluntary, was not patterned after by other Christians, and was a failure. Bûddhism and other Oriental religious systems have for ages had followers who have practiced a rude communism. In Europe there were numerous mediæval sects (Catharists, Brethren of the Free Spirit, etc.) who advocated some practice of the kind. Later came the Anabaptists of Münster, the Libertines of Switzerland, the Familists of England. Still later we find the Herrnhuters, the Shakers, the Harmonists, the Buchanites, and numerous other religious communists—some practically successful and others not.

The ONEIDA COMMUNITY (*q. v.*) is perhaps the best-known example in the U. S.

Bacon, More, and other English theorists long ago wrote treatises which looked toward the ultimate establishment of communism, but Robert Owen was the first great advocate of the doctrine in the United Kingdom. The first French revolution brought forward a number of communistic theories, but none survived long; the best-known writer of that

time was Babœuf. Subsequently these ideas were taken up by Saint-Simon, Fourier, Proudhon, and others. (See ANARCHIST and SOCIALISM.) A large number of socialists, including the whole Russian wing of the party, believed that property should be held and industry controlled, as far as possible, by communities, or "communes," modeled more or less on the village communities of Russia. In thus laying stress on the commune they wished to weaken the powers of the central government, and adopted the doctrines of *anarchism* as distinct from *socialism*, which would increase the central government's power. In 1871, at the close of the Franco-German war, the communists gained control of Paris by revolution; but being unable to maintain it, they indulged in murder and arson in such a way as to throw universal discredit on the name which they bore and the theories with which they were identified.

Revised by A. T. HADLEY.

Community Property: in law, property acquired by husband and wife or either of them during marriage, when not acquired as the separate property of either of them. It includes the product of their industry and all property vesting in them by purchase, donation, bequest, or descent. The institution of community property is borrowed from the civil law, and has many of the incidents of partnership, but is not identical with it. It is recognized by statute in Louisiana and California, and in a number of other States created out of what were once French or Spanish dominions, and whose laws have consequently been influenced by the civil law. In these States all property held by either husband or wife during coverture is *prima facie* presumed to be community property. During coverture the wife's rights are passive, and the husband has full power to dispose of it absolutely and without her consent, but he can not dispose of any interest in it by an instrument to take effect after his death. The survivor has, in general, one-half of the community property and the other half goes to the heirs.

F. STURGES ALLEN.

Commutator (in electricity): a device for converting the alternating currents, generated in the armatures of dynamo-machines, into continuous currents. (See ALTERNATE CURRENTS and DYNAMO.) In its usual form it consists of a series of copper blocks arranged symmetrically around the armature-shaft, and insulated from the latter and from each other. To these are attached the terminals of the various coils, the current from which is to be commuted. Brushes of copper or of carbon are brought to bear at proper points upon the commutator, making connection with each coil or set of coils in turn, and conveying the currents induced in them to the outside line. The essential point of the device is so to arrange the contacts that while the currents within the armature are reversed, at least twice in every revolution of the machine, the current in the outer circuits shall always have the same direction. E. L. NICHOLS.

Commute [from Lat. *com*, with + *muto*, change]: to change or exchange (one thing for another); thus one penalty is often commuted as an act of clemency for another which is less severe, as a sentence of death to imprisonment. Officers in the army are sometimes allowed to commute their allowances for quarters, forage, etc., for cash.

Comne'nus (in Gr. Κομνηνός): the name of a Byzantine family of Italian origin, from which descended six Emperors of the East and all the Emperors of Trebizond. See ALEXIS I., ANDRONICUS I., ISAAC I., MANUEL I., and ANNA COMNENA.

Co'mo (anc. *Comum*): a province of Italy; bounded N. by Switzerland and Sondrio, W. by Novaro, S. by Milan, E. by Bergamo and Sondrio. Area, 1,049 sq. miles. It consists of the territory about Lake Como and the eastern part of Lake Lugano, and reaches westward to Lago Maggiore. This province contains several magnificent regions; the finest of them is the tract called Brianza, lying between Monza and the two southern branches of Lake Como, which is as much as 25 miles long and from 1 to 3 miles broad, and watered by the Adda. The province produces much silk and wine. The principal industry is the rearing of silkworms. Pop. (1880) 518,372; (1890) 551,617.

Como: a city of Italy; in Lombardy; capital of province of same name; at the southwestern extremity of the Lake of Como; 24 miles N. of Milan, with which it is connected by a railway (see map of Italy, ref. 2–C). It is beautifully situated in a valley inclosed by verdant hills, covered with gardens and groves of orange and olive trees. On a hill overlooking the town are the ruins of the castle Baradello, which was destroyed by Frederick Barbarossa. It has a fine cathedral founded in 1396, by the side of which is a clock-tower built in 1463. Here are also an ancient town-hall, a public library, a museum, theater, and botanic garden. Here are manufactures of cotton yarn, silk and woolen fabrics, and soap. It has a trade by the lake with Ticino and Germany. Pop. 27,000. *Comum* was an important town under the Romans. Pliny the Younger and Volta were natives of this place.

Como, Lake (in Ital. *Lago di Como*; anc. *Larius Lacus*): a lake of Italy, in Lombardy; is an expansion of the river Adda, which enters it at the foot of the Lepontine and Rhetian Alps, and issues from the southeastern extremity of the lake. It is divided into two branches, one of which, extending southwestward, is called the Lake of Lecco. It is 698 feet above the sea, and about 35 miles from Como to the northern end, and is nearly 3 miles wide. Its greatest depth is 1,925 feet, the superficial extent 62 sq. miles. It is celebrated for the beautiful scenery of its shores, covered with elegant villas. Numerous steamboats ply on this water.

Comonfort, IGNACIO: Mexican general; b. at Puebla, Mar. 12, 1812. He early took part as a soldier in political struggles, held various civil and military offices, served in the war with the U. S., and was several times elected to Congress. In 1853 Santa Anna dismissed him on false charges from the inspectorship of the custom-house at Acapulco. In Apr., 1854, he revolted at Acapulco, and withstood a siege there by Santa Anna with 7,000 men. In the campaign which followed he took a leading part, and after the flight of Santa Anna he was made Secretary of War by Alvarez (Oct., 1855). Alvarez, being bitterly opposed, retired Dec. 11, appointing Comonfort his successor as acting president. From the first Comonfort had to contend with the Church and conservative party and with opposition in the army. A revolt which broke out at Puebla the day after his succession was put down after hard fighting, but the Bishop of Puebla continued to incite opposition, and was finally deported, May, 1856. This and some confiscations of ecclesiastical property increased the alarm of the Church party. There were other revolts at Puebla and elsewhere, and Mexico itself became a center of plots. A new constitution was promulgated Feb. 7, 1857, and under it Comonfort was regularly elected president for four years, assuming office Dec. 1, 1857. Less than three weeks after conspirators at Tacubaya declared against the constitution, and demanded that Comonfort should assume dictatorial powers pending the call for a new constitutional assembly. Without definitely adhering to this sedition Comonfort encouraged it by his weakness. Thus he at once lost the support of public opinion, his own minister, Juarez, heading the opposition. Congress voted his deposition, and on Jan. 11, 1858, a portion of the garrison of Mexico declared against him. A series of bloody fights followed in the streets of the capital. Deserted at last by nearly all his friends, Comonfort fled, and on Feb. 7 embarked at Vera Cruz, going to the U. S., and thence to France. He was allowed to return in 1862, was restored to his rank of general of division, and during the resistance to the French invasion commanded the army of the center. His defeat at San Lorenzo (May 8, 1863) forced Orteaga to surrender at Puebla. Comonfort was Minister of War in the Juarez cabinet, formed after Mexico had been lost. He was killed by irregular troops or bandits between Guanajuato and San Luis Potosí, Nov. 13, 1863. HERBERT H. SMITH.

Comorin, Cape: See CAPE COMORIN.

Co'morn, or **Komorn**: a county of Hungary; bounded on the N. by the counties of Presburg, Neutra, and Bars, on the E. by Gran, on the S. by Stuhlweissenburg, and on the W. by Raab. Area, 1,146 sq. miles. It is divided into nearly equal parts by the Danube, besides which it is also traversed by the Waag river. In the north it is level, but in the south it is mountainous. The country at the entrance of the Waag into the Danube consists of large swamps. The soil is generally fertile and well cultivated; sheep-raising is extensively pursued. Chief town, Comorn. Pop. (1890) 159,397.

Comorn, or **Komorn**: a fortified town of Hungary; capital of county of same name; on the left bank of the Danube; at the mouth of the river Waag; 46 miles W. N. W. of Pesth; on the Great Schütt island at its eastern extrem-

ity (see map of Austria-Hungary, ref. 5–G). The streets are narrow and irregular. The Danube is here crossed by a bridge of boats. The fortress of Comorn, originally built by Matthew Corvinus, is considered one of the strongest in Europe, and requires for its defense 15,000 men. It was besieged and bombarded by the Austrians in 1848 and 1849 without success, but finally capitulated of its own choice Sept. 27, 1849. Pop. 13,100.

Com'oro Isles: a group of four larger islands and several smaller ones situated in the Mozambique Channel about half-way between Africa and Madagascar (see map of Africa, ref. 7–H). They are volcanic in origin and mountainous, and the highest peaks rise about 8,500 feet above the sea. The soil is fertile. The prolific tropical vegetation includes the cocoa and arcca palms, excellent rice and maize, yams, bananas, mangos, pincapples, oranges, lemons, cotton, wild indigo, and sugar-canc. Excellent wood for ship-building is found. The principal exports are palm oil and tortoise-shells. Thc people are partially Arab and partially Malagasy in blood, and arc mostly Mohammedans. They support themselves chiefly by tillage; there are among them skillful cutlers, weavers, and jewelers. Mayotte, one of these islands, has long been a French colony. The island of Johanna is celebrated for its beauty. The entire group was ceded to France in 1886. The islands once had considerable trade, which extended to India. Pop. estimated, 47,000, exclusive of Mayotte, which in 1889 had 12,270 inhabitants.

Company: See JOINT-STOCK COMPANY and PARTNERSHIP.

Company: in military usage, a body of troops commanded by a captain, assisted by his lieutenants, sergeants, and corporals. The Greek tetrarchia of sixty-four men corresponded to the company of infantry, which until quite recently varied in strength from about 60 to 100 men, the size being regulated so that the captain could personally watch and by his voice and example control the action of every man, making the company thc strict "unit of combat." The strength of the company of cavalry (troop) and of artillery (battery) is determined by the same considerations. In the European armies of to-day the companies arc much larger, giving fewer officers, and consequently reducing the pay-rolls. The war strength of the German company is 250 men. The captain is mounted. JAS. MERCUR.

Comparative Anatomy: See ANATOMY, COMPARATIVE.

Comparative Philology: This term, when used as it commonly is among English-speaking people, in the narrower sense of comparative grammar, denotes that branch of the science of language which seeks by a comparison of the grammatical phenomena of cognate languages to reconstruct the parent speech from which these languages are derived, and so to aid in tracing the historical development of the single languages. The former of its aims makes it an auxiliary of anthropology, of ethnography, and of history in general; the latter makes it an auxiliary of historical grammar. Historical grammar occupies itself with the attempt to explain the grammatical phenomena of a language as developments out of precedent phenomena; i. e. it views them according to their *becoming*, in distinction from descriptive grammar which notes and studies them simply as *being*. Historical grammar, apart from the help of comparative grammar, can pursue its investigation of the development of a sound, a form, or a construction no further back than the point where the language first obtained a record. (See LANGUAGE.) Thus among the various branches of the Indo-European family the Slavic can be followed back to the ninth century A. D., the Celtic to the eighth, the Armenian to the fifth, the Teutonic to the fourth, the Italic to the early part of the third century B. C., the Greek to perhaps the ninth B. C., and the Indian or Sanskrit to perhaps the fifteenth B. C. Without the help of comparative grammar Teutonic grammar would be compelled to begin the history of the word for *yoke* with Gothic *juk*, Greek grammar with *ζυγόν*, Latin with *jugum*, Slavic with *igo*, Sanskrit with *yugám*; but comparative grammar, by demonstrating that the Indo-European form from which all of these were differentiated was *yugo'm*, adds a new and all-important point through which to construct each separate line of development. In like manner, from Gothic *sibun*, seven, O. Bulg. *sedmĭ*, Lat. *septem*, Gr. *ἑπτά*. Skr. *saptá*, is reconstructed an Indo-European *septṃ̄*. From Fr. *chance*, Ital. *cadenza*, Span. *cadencia*, Ruman. *cădeuță*, is reconstructed an unrecorded Vulg. Lat. subst. **cadentia*, a fall, derived from *ca'dere*. A consideration of the fact that the Gr. genitive and the Lat. ablative share, among the various forms of verbal relation which they denote, only the *from*-relation, leads to the conclusion, which is also supported by other evidence, that the original value underlying the use after comparatives of the genitive in Greek and the ablative in Latin is that of separation, so that, e. g., the original meaning of the ablative in Lat. *filius minor est patre*, "the son is less than the father," properly is "measured from the father." The conscious beginnings of a science of comparative grammar were made by Franz Bopp (1791–1867), whose first work, *Ueber das Conjugationssystem der Sanskritsprache in Vergleichung mit jenem der griechischen, lateinischen, persischen und germanischen Sprache*, appeared at Frankfort-on-the-Main in 1816. The immediate occasion of the development of the science was the attention which had been called to the Sanskrit language in the latter part of the eighteenth century, and especially the discovery first made and proclaimed in distinct form by William Jones, an English resident at Calcutta, that the Sanskrit stood in definite relationship to the languages of Europe. The immediate purpose of Bopp's work as followed in the above-mentioned book and in his *Vergleichende Grammatik des Sanskrit, Zend, Griechischen, Lateinischen, Litauischen und Altslavischen, Gothischen und Deutschen* (1833–52; second edit. 1857–61), was the explanation of the force and signification of the different elements composing the forms of inflected words. Thus he isolates the personal endings of the verb *-mi*, *-si*, *-ti*, and seeks to identify them with the pronouns of first, second, and third person respectively. The augment he identifies with alpha-privativum, and attributes to it originally the power of negating the present and so of expressing past time. The case-endings of the nouns he believes to have had their origin largely in pronominal roots; thus the *-s* of the nominative was the pronoun, Skr. *sa* = Gr. *ὁ*.

While the honor of originating the comparative method rests with Bopp, the real founder of historical grammar, in the service of which the comparative method has found its chief application, was Jacob Grimm (1785–1863). To him we owe the first formulation of a law of sound, and the consequent perception that changes of sound take place according to definite historical lines. His *Deutsche Grammatik* (1819–37, 4 vols.) was not only the first example of an historical grammar, forming the prototype for the later great works of the kind, such as Dicz's (1794–1876) *Grammatik der romanischen Sprachen* (1836–43) and Miklosich's *Vergleichende Grammatik der slawischen Sprachen* (1852–74, 4 vols.), but constituted also an application of the comparative method to the various branches of a single language. As such it exercised in its turn a marked influence upon the plan and method of Bopp's *Vergleichende Grammatik*.

The application of the comparative method to the vocabularies of the Indo-European languages in the interest of etymology was the pre-eminent service of August Friedrich Pott (1802–88), whose chief work is the *Etymologische Forschungen* (1833–36, 2 vols.; 2d ed. 1859–76, 5 vols.).

In the rapid development of the science of Indo-European comparative grammar since the foundation period, two definite points may be noted, each marked by the appearance of a great summarizing work. The first is August Schleicher's (1821–68) *Compendium der vergleichenden Grammatik der indogermanischen Sprachen* (1861); the second Karl Brugmann's *Grundriss der vergleichenden Sprachwissenschaft der indog. Sprachen* (1886–92, 2 vols.; also an Engl. transl.). In the progress of the science have shared in most eminent degree, besides the above-mentioned scholars, Theodor Benfey, Adalbert Kuhn, G. Ascoli, Georg Curtius, B. Delbrück, August Fick, August Leskien, Johannes Schmidt, Ad. Bezzenberger, Hermann Osthoff, Hermann Paul, Karl Verner, Fr. de Saussure, J. Wackernagel, Heinrich Zimmer, H. Hübschmann, Gustav Meyer, Fr. Kluge, Hermann Collitz, Rudolph Thurneysen, Maurice Bloomfield, K. F. Johansson, and others.

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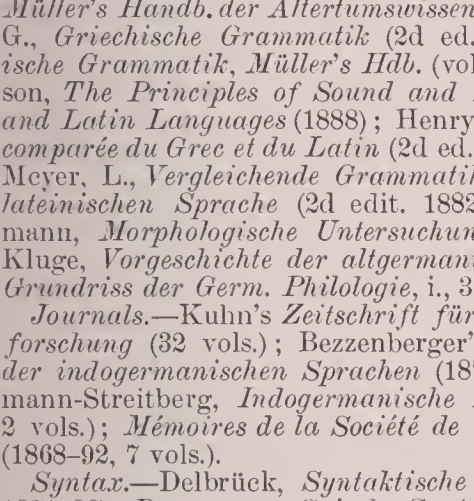
Comparet'ti, DOMENICO PIETRO ANTONIO: Italian philologist; b. in Rome, June 27, 1835; became Professor of the Greek Language and Literature in Pisa in 1859, and subsequently in Florence. Later, as professor emeritus, he has directed the course in Greek antiquities in the University of Rome. His reputation, however, does not solely or even mainly rest upon his Greek studies. He is a Romance philologist of excellent quality, and is particularly familiar with the intellectual history of the so-called Dark and Middle Ages. Among his productions may be mentioned *Saggio dei dialetti greci dell' Italia Meridionale* (1866); *Edipo e la Mitologia comparata* (1867); *Virgilio nel Medio Evo* (1872); *Le antiche rime volgari*, etc. (with A. D'Ancona, 1875, *seq.*); *Canti e racconti del popolo italiano* (1875, *seq.*).
A. R. MARSH.

Compass [from O. Fr. *compas*, measure, pair of compasses, derived from a verb of Lat. type **compassa're* (Eng. to *compass*), measure off with steps (*passus*, step)]: an instrument used to show the magnetic meridian or the position of objects with reference to it. Among its various forms are the *mariner's* compass, the *surveyor's* compass, and the *variation* compass. These several applications each demand a special construction, but the essential parts are invariably the same. These parts are the needle, which consists of a magnetized bar of steel, and, fitted to its center, a cap which is supported on a pivot upright and sharp at the point to lessen the friction, and on which the needle may move with the slightest attraction. A circular card is attached to the needle of the *mariner's* compass, which turns with it, and indicates the degrees, which with the thirty-two points, divided into half and quarter points, are all marked on its circumference. The pivot is fastened to the bottom of a circular box, which contains the needle and card, and has a glass cover to protect the needle from the air. This is called the compass-box, and is suspended in a larger box or binnacle by two concentric brass circles called gimbals; the outer one is attached by horizontal pivots to the inner circle and to the outer box, the two sets of axes being at right angles to each other. Thus the inner circles, carrying the compass, box, needle and card, is sustained in a horizontal position, and is not subject to the rolling of the ship.



Mariner's compass.

"Boxing the compass" is the enumeration, by name, of the thirty-two points which are marked upon the compass-card. These points are—north, north by east, north-northeast, northeast by north, northeast, northeast by east, east-northeast, east by north, east, etc.

The *surveyor's* compass has its circle divided into degrees or half degrees, and is furnished with vertical sights in order to secure accurate pointing. It is graduated from 0° to 90° from both N. and S. around to E. and W., so that the position of the north end of the needle indicates the magnetic bearings of the line on which the sights are pointed.

The *variation* compass shows such changes as occur daily in the deviation of the magnetic from the true meridian. The needle is much longer than in the mariner's compass, in order to make minute variations more apparent. Another form of variation compass is a surveyor's compass with a movable limb which can be set, with the help of a vernier, so that the readings are true bearings instead of magnetic ones. See magnetic declination, etc., in the article MAGNETISM, TERRESTRIAL.

The origin of the compass is undoubtedly to be ascribed to the Chinese, who more than a thousand years B. C. made use of the loadstone to guide their cars or carriages without the aid of the sun or stars. It is certain that they employed the magnetic needle in the navigation of vessels soon after the Christian era, if not earlier. There is, indeed, every reason to believe that the mariner's compass was not an original European invention, but was introduced from China. None of the early European writers speaks of it as invented in Europe; and it is certain that the compasses used by the Italians in the thirteenth century were constructed exactly like those made in China about the same period. The compass is mentioned by a Spanish Arab poet as early as 853, by Guyot of Provence, 1190, and by Raymond Lully, 1286. Revised by MANSFIELD MERRIMAN.

Compass-plant: the *Silphium laciniatum*, a remarkable plant of the order *Compositæ*. It grows on the rich prairies of the Mississippi valley, and its radical leaves have, while growing, especially in midsummer, the property of pointing quite nearly to the N. and S. It was first made known to the scientific world by Gen. Benjamin Alvord in communications to the National Institute in Aug., 1842, and Jan., 1843. The accuracy of his statement being questioned by the botanists, he made another communication in Aug., 1849, to the American Association for the Advancement of Science. The truth of his observation was then admitted by Dr. Asa Gray, who attributed its polarity to the action of light. W. F. Whitney, in the *American Naturalist* for Mar., 1877, gives the result of a microscopic examination of the leaves, showing on each face an equal number of "stomates" or "breathing-pores," which confirms the conclusion that its position, facing the rising and setting sun, is due to the action of light. All the other experiments confirm this theory. Longfellow, in *Evangeline*, made a noteworthy allusion to it, in the latest edition using "vigorous plant" instead of "delicate plant." See *Nature*, Feb. 1, 1877. For illustration, see SILPHIUM.

Compasses: See DIVIDERS.

Compayré, JULES GABRIEL: See the Appendix.

Compensation of Errors: the neutralizing in instruments for accurate measurement (e. g. of time, pressure, temperature, distance, etc.) of errors caused by certain properties of the material agents used, by the introduction of other material agents which, acting alone, would produce errors of an opposite character. Thus the expansion of the pendulum-rod by heat may be counteracted by making

its weight of a much more expansive material, as lead or mercury, and connecting it with the rod by its lower end.

Competition: See Political Economy.

Compiègne, kōn′pi-āñ′: a town of France; department of Oise; on the Oise and on the railway from Paris to St.-Quentin; 44 miles N. N. E. of Paris (see map of France, ref. 3–F). It has a communal college and a public library of 28,000 volumes; also manufactures of muslin, hosiery, and cordage. The town contains an interesting Romanesque church (St. Jacques) and a beautiful town-hall of the sixteenth century. The neighboring palace (Château de Compiègne) was completed nearly in its present form by Louis XVI.; it is largely made up of older structures, and, although its exterior is agreeable in style, it is not an important building. It is now used chiefly as a museum. It was while heading a sortie from Compiègne (1430) that Joan of Arc was captured by the English who were besieging it. Pop. (1896) 15,225.

Complement [from Lat. *complemen'tum*, that which fills up; deriv. of *comple're*, fill up]: a full quantity or number; the number required or limited; that which completes or fills up. In mathematics, the complement of any magnitude is a second magnitude, which, added to the first, gives a sum equal to a constant third magnitude, which is purely arbitrary and conventional. Thus the complement of an angle is its defect from a right angle. The arithmetical complement of a number is its defect from the next higher power of ten. The arithmetical complement of 64 is 36.

In astronomy the complement of a star is its angular distance from the zenith.

Complement, in music, the quantity required to be added to any interval to complete the octave; for example, a sixth is the complement of a third, and is formed by the higher note of the third, and the note an octave above the lower note of the third.

Complementary Colors: any two colors which when mixed produce white. The mixture should be that of the light reflected from the surfaces to be compared, and not a mechanical mixture of the pigments themselves. The method which gives the best results is that of revolving disks painted in sectors with the colors to be compared. Owing to the persistence of vision, such a particolored disk when in rapid rotation presents a uniform surface to the eye. When the two colors with which it is painted are complementary, and are arranged so as to occupy proper relative areas on the disk, this surface will be white, or a neutral gray. This method is due to Clerk Maxwell. Prof. Rood, using a modification of Maxwell's method, has established the following set of complementary colors:

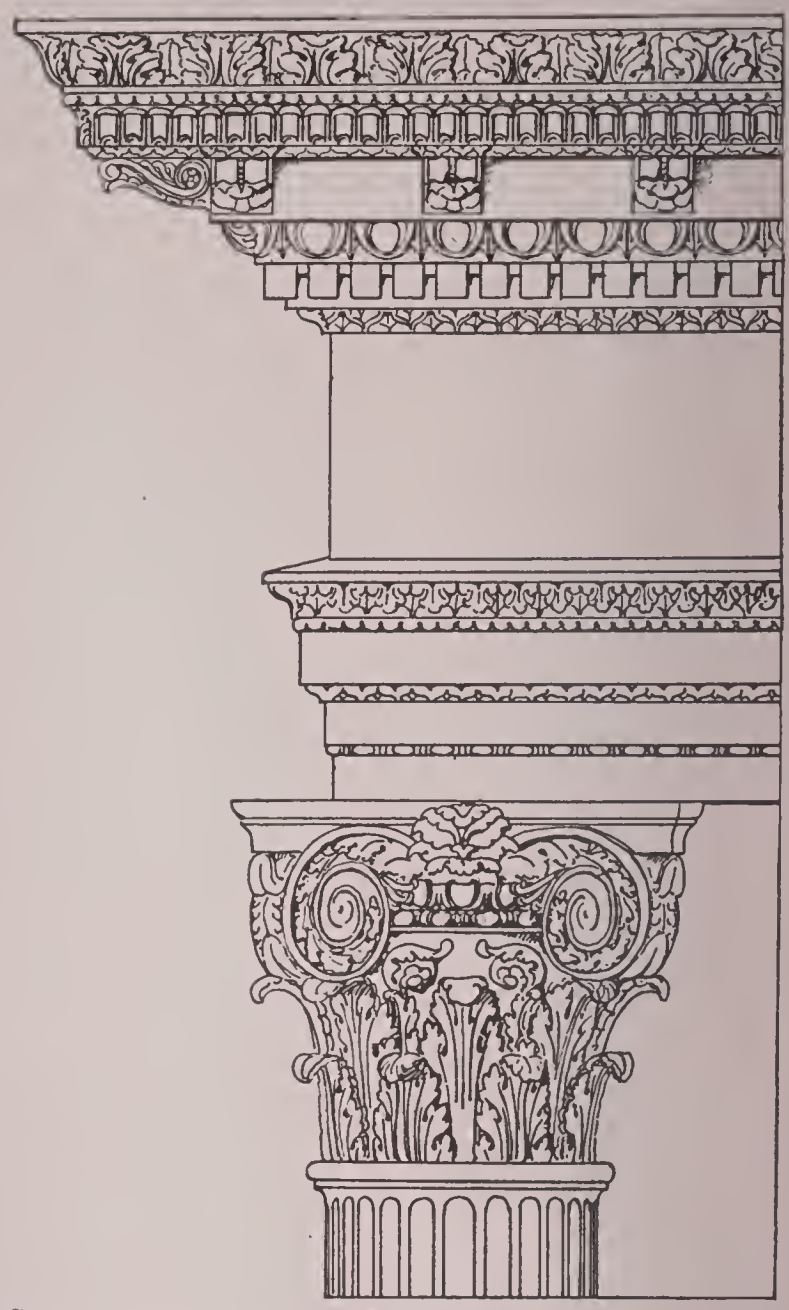
Carmine and blue green.	Greenish yellow and French blue.
Vermilion and green blue.	
Orange and greenish blue.	Green yellow and violet.
Yellow and blue.	Green and purple.

See Rood's *Text-book of Color*, chapter xi. E. L. Nichols.

Com'plin, or **Com'pline** [deriv. of Lat. *complere*, complete; so called because it closes the services for the day]: the last of the canonical hours in the Roman Catholic Church, following vespers. It consists of a general confession, four psalms, a hymn, the *Nunc Dimittis*, prayers, and a commemoration of the Blessed Virgin. The corresponding office in the Greek Church is called *apodeipnon* (the after-supper service).

Compluten'sian Bible: a polyglot in six volumes, folio, so called from *Complutum*, the Latin name of Alcalá in Spain, where it was printed. It contained the original texts, the Vulgate, the Septuagint, the Targum of Onkelos on the Pentateuch; the last two with a literal Latin translation. It was projected by Cardinal Ximenes, who spent about $150,000 upon it. It was commenced in 1502, printed between 1514 and 1517, authorized by Pope Leo X. in 1520, but apparently not circulated before 1522. Only 600 copies were printed, which were sold for about $20 a copy. A copy purchased for Union Theological Seminary in New York city in 1883 cost about $750.

Composite Order: in architecture, a form of column and entablature invented by the Romans, and characterized by a combination of Ionic and Corinthian elements in the capital. This was composed of an Ionic abacus and echinus with large corner volutes, and the lower half of a Corinthian capital with its two rows of acanthus leaves. The proportions of the column and the entablature were identical with the Corinthian, of which it was a mere variant (arch of Septimius Severus, baths of Caracalla, etc.). The architects of the later Italian Renaissance invented various forms of entablature to accompany this capital. The composite order has never had any great vogue in modern times, being at best a patchwork of forms. A. D. F. Hamlin.



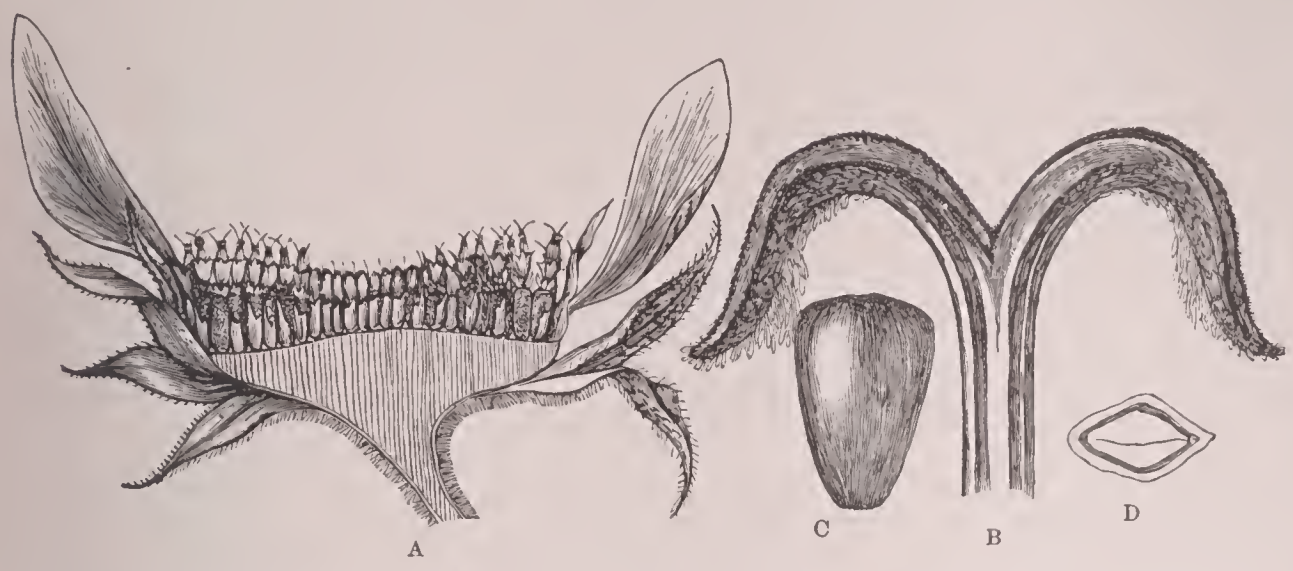
Composite order. From arch of Titus. Drawn by A. D. F. Hamlin.

Compos'ites [from Lat. past ptc. of *compo'nere*, put together, construct]: an enormous family (*Compositæ*) of flowering plants (containing 12,000 or more species) now generally regarded as representing the highest development of the dicotyledonous structure. All parts of the plant-body are well developed, and in the floral structure we find the widest departure from the primitive dicotyledonous flower (presumedly somewhat like that of the buttercups—*Ranunculus*). The compound pistil is compacted into a one-celled, one-seeded, inferior ovary, the stamens are united into a single anther-ring, the petals are united into a narrow tube or a flat blade, and the calyx, when present, is usually modified specially (as a pappus) for the dispersion of the seed. Moreover, the small flowers are massed into heads, which are often given prominence by the special modification of the marginal flowers.

Common examples of the composites are afforded by the sunflowers, thistles, asters, and golden-rods, and the family is often called the sunflower family. They are widely distributed throughout all parts of the world, being especially abundant in America. In temperate and cold climates they are mostly herbaceous annuals or perennials, but in warmer regions many are shrubby or tree-like. On the Great Plains of North America and in the Rocky Mountain region species of *Artemisia*, known as "sage brush," are shrubs from 3 to 10 feet in height.

Some composites are of economic interest, yielding food or medicines, e.g. lettuce (*Lactuca sativa*), artichoke (*Cynara scolymus*), Jerusalem artichoke (*Helianthus tuberosus*), wormwood (*Artemisia* of several species), arnica (*Arnica mon-*

tana), etc.; many are important for ornamental purposes, e. g. species of *Aster*, *Solidago* (golden-rods), *Chrysanthemum*, *Zinnia*, *Dahlia*, etc. Some of the most troublesome weeds in the U. S. are members of this family, as the thistles



Structure of the sunflower (*Helianthus annuus*). A, section of a head of flowers; B, end of the pistil showing the two-lobed stigma; C, ripe fruit (achene) containing a single seed; D, cross-section of an achene showing the large embryo.

(*Cnicus* of several species), ragweeds (*Ambrosia* of several species), cockleburs (*Xanthium*), Spanish-needles (*Bidens*), ox-eye daisy (*Chrysanthemum leucanthemum*), etc.

CHARLES E. BESSEY.

Composition with Creditors: an agreement between a debtor and two or more of his creditors, by the terms of which he is to pay, and they are to receive, a certain percentage upon their claims in lieu of full payment. Such a contract is valid, as it is held that the mutual agreement of the creditors is a sufficient consideration. F. S. A.

Composition of Forces: in mechanics, the discovery of one or a limited number of forces which shall be the equivalent of a system of given forces acting on a body. The single force or combination of forces to which the given ones are reduced is called their *resultant*. When the body is considered as a material particle or point on which all the forces act, any number of forces will have a single resultant, which may be determined as follows:

Imagine each force to be represented as a straight line going out in the direction of the force, and proportional in length to the intensity of the force. Arrange the lines thus found end to end in any order whatever, the first line going out from the point in the direction of the force to which it corresponds; the second line from the end of the first one, in the direction of the force to which it corresponds; the third line to begin at the end of the second line, and to be drawn in the direction of the third force, etc.; then a single line, drawn from the beginning of the first line to the end of the last one, will represent the resultant, both in intensity and direction.

We readily see that if there are but two forces, the resultant will be the diagonal of the parallelogram, two of whose adjacent sides represent the given forces. The theorem of the composition of two forces in this way is therefore called the parallelogram of forces. The composition of any number of forces, in the way we have described, is equivalent to the drawing of a series of parallelograms, the diagonal of each being a side of that next following.

When the forces act on a solid body, and the lines in which they act do not all pass through the same point, the simplest form to which the resultant can always be reduced consists of two actions: first, a force acting along a certain line, with a certain intensity; second, a couple, tending to turn the body around an axis parallel to this line. This is Poinsot's theorem of the composition of forces.

Intimately connected with the composition of forces is their resolution, which consists in resolving a single force into three different forces, acting in given directions. The directions being given, the condition which the forces must fulfill is that, when these two directions are combined in the manner above explained, the resultant force must be equal to the given one, both in intensity and direction. By combining the two operations, any forces whatever acting on a point can be resolved into three acting in any given direction. The couples of rotating forces may be compounded and resolved in the same way, the resultant being then represented as equivalent to three couples, each tending to rotate the body around one of three given axes. See COUPLE OF FORCES.

S. NEWCOMB.

Compost [from Lat. *compo'situm*, neut. of past ptc. of *compo'nere*, put together]: an indefinite agricultural term used to designate any pile or mass of fermenting material which is to be used for the enrichment of the land. Formerly composts were very much used, but they have been largely superseded in recent years by the concentrated or chemical fertilizers, in which the fertilizing materials are present in known and definite amounts, and which are much lighter and cheaper to handle. The compost still has a very important use upon the farm, however, because land often needs the loosening effect which fibrous and bulky materials alone can give, because it affords a ready means of utilizing refuse, and because the escaping or leaching elements of farm manures and other materials may be caught and saved if these materials are mixed in a compost heap. The organic acids engendered by the fermentation of the compost heap are often powerful agents in the reduction of the insoluble phosphates in bone. The compost heap is ordinarily a long, narrow, and low pile, which should be "turned" three or four times a year to insure uniform fermentation and to prevent heating. Gardeners usually prefer compost at least a year old. L. H. B.

Compostella: See SANTIAGO DE COMPOSTELLA.

Compound Animals: organisms of low grade (although some are comparatively high) in which parts generally regarded as individuals, and which are certainly distinct in many vital functions, are merged into one compound system. The living mass in all truly compound animals appears to originate from a single ovum, and the subsequent development of the individual parts by gemmation resembles in some respects the growth of vegetables. Examples of compound animal life are found in coral-polyps, ascidians, bryozoans, etc. Revised by F. A. LUCAS.

Compound Fracture: in surgery, a fracture of any bone when the skin and tissues covering the bone are so lacerated that air may enter the fracture. The treatment of compound fracture requires the highest surgical skill. See FRACTURE.

Compound Interest: See INTEREST.

Compounding of Felony: in law, the criminal offense of forbearing to prosecute a felony in consideration of a reward or some other benefit moving to the person exercising the forbearance. Similar forbearance with respect to a misdemeanor is also criminal in the U. S., but in Great Britain may be exercised with the consent of the court. A note or other promise taken on such a consideration is illegal in its inception, and can not be enforced in a court of justice by the promisee. The act of merely receiving back one's goods or of taking reparation is not an offense. See FELONY.

Revised by F. STURGES ALLEN.

Compound Microscope: See MICROSCOPE.

Compressed Air: as an agent for the transmission of motive-power, is extensively used in tunneling, mining, and quarrying, and in other operations where belts or shaftings can not be employed on account of the great distance between the motive-power and the point of application. The air is conveyed through strong pipes and tubes from the compressing plant to the drills or other machinery, and is utilized in a cylinder similar to that of the STEAM ENGINE (*q. v.*). An additional advantage in mines and tunnels is that the exhaust aids in ventilation and in keeping down the temperature. It was first used extensively in the con-

struction of the railway tunnels of Mont Cenis and Hoosac Mountain in Massachusetts. In many cases it has been superseded by electricity.

Compressibility: the property of being compressible into smaller space; susceptibility of being reduced by pressure to smaller dimensions. All bodies are compressible, the degree of compressibility being greatest in gases and least in compact solids. Liquids hold an intermediate place. The compressibility of most solids and liquids is so slight that for all ordinary pressures they may be regarded as incompressible. If the pressure upon a body of water be increased by one atmosphere (one megadyne per square centimeter of surface), the decrease in volume will be about $\frac{5}{100000}$. Steel under the same conditions would lose only about $\frac{5}{1000000}$ of its volume.

Any gas subjected to a like change of pressure, i. e. from one to two atmospheres, would lose half of its volume, and under further increase of pressure compression would go on at the same rate (pressure and volume being always inversely proportional), until, if the experiment be tried at a proper temperature, condensation would occur, and the gas would go over into liquid form.

Revised by E. L. Nichols.

Compromise: something promised or agreed upon mutually; an amicable agreement between two parties or persons who have been involved in a legal controversy that they will settle the difference by mutual concessions.

Compton, Henry: an English prelate who had a large share in the revolution of 1688; b. at Compton Wynyates, Warwickshire, 1632; held for a few months a commission in the army, then after study at Cambridge entered the Church 1662; became Bishop of Oxford in 1674; was transferred to the see of London in 1675; was the instructor of the daughters of the Duke of York (afterward James II.), who became consequently attached to the Protestant faith. He incurred thereupon the bitter hostility of James, who, through the infamous Judge Jeffreys, deposed him from his episcopal functions (1686). This was one of the grievances done to the Protestant religion alleged by William in his proclamation on landing (1688). James, in alarm, re-established Compton, who, however, openly joined himself to the party of the invader, and with his own hands crowned him king Apr. 11, 1689. D. at Fulham, July 7, 1713.

Comptroller, kon-trōl′*er* [see Controller for etymology]: an officer charged with certain duties in the regulation of the fiscal affairs of a government or municipality, such as the auditing or in other ways superintending and preserving the public accounts. In the U. S. the office of comptroller was first created upon the organization of the board of the Treasury by the Continental Congress in 1778, and by the act of Congress constituting the Treasury Department of the U. S. the office was continued under the title of Comptroller of the Treasury. The U. S. officers now designated by the title of comptroller are:

The First Comptroller of the Treasury, who countersigns warrants drawn by the Secretary of the Treasury upon the treasurer, examines the accounts of the first and fifth auditors, receives appeals from the sixth auditor, superintends unsettled accounts of the Treasury, Navy, War, and Interior Departments, prosecutes all debts and delinquencies in behalf of the U. S., etc.

The Second Comptroller of the Treasury, who examines the accounts of the second, third, and fourth auditors, countersigns warrants for the pension and Indian bureaus, and performs duties in the Navy and War Departments analogous to those of the first comptroller in the Treasury Department.

The allowance of a claim by the proper comptroller is final; when a claim has been refused, appeal may be made to the court of claims.

The Comptroller of the Currency, who issues printed notes to the national banks, exchanges new currency for that which is worn out, superintends the national banks, reports their condition annually to Congress, and has numerous other important duties. He gives heavy bonds before entering upon his duties, and is not allowed to be interested directly or indirectly in any institution issuing notes under the U. S. banking laws. There is also a deputy comptroller of the currency. Revised by F. Sturges Allen.

Comstock, Anthony: b. Mar. 7, 1844, at New Canaan, Conn.; educated at the academies of New Canaan and New Britain, Conn.; served in the Union army 1863–65. He has been post-office inspector since Mar., 1873, and secretary and chief special agent of the New York Society for the Suppression of Vice since its organization in 1873. In the interest of good morals, Mr. Comstock and his associates have made many arrests and seized and destroyed a great amount of obscene matter and gambling materials. He is author of *Frauds Exposed* (1880); *Traps for the Young* (1883); *Gambling Outrages* (1887); *Morals versus Art* (1887); and is a contributor to the *North American Review*, *Our Day*, and other magazines.

Comstock, Cyrus Ballou: U. S. military officer and scientist; b. Feb. 3, 1831, in Massachusetts; graduated at West Point in 1855; colonel Corps of Engineers Apr. 7, 1888. He served in constructing fortifications 1855–59; as assistant professor at the Military Academy 1859–61; in the civil war in erecting defenses of Washington 1861–62; in Maryland campaign 1862, at South Mountain and Antietam; as chief engineer Army of the Potomac 1862–63; in Rappahannock campaign 1862–63, engaged at Fredericksburg and Chancellorsville; in the department of the Tennessee 1863, engaged at Vicksburg (brevet major), and as chief engineer Army of the Tennessee; assistant inspector-general of the military division of the Mississippi 1863–64; as senior A. D. C. to Lieut.-Gen. Grant, rank of lieutenant-colonel, 1864–66; in Richmond campaign 1864–65, engaged at Wilderness (brevet lieutenant-colonel), Spottsylvania, Cold Harbor, assaults of Petersburg and mine, and Fort Harrison; as chief engineer of the expedition to Cape Fear river, N. C., 1865, engaged at Fort Fisher (brevet colonel U. S. army and brevet colonel and brigadier-general U. S. volunteers); as senior engineer in Mobile campaign 1865, engaged at the siege of Spanish Fort, storming of Blakely, and capture of Mobile (brevet brigadier-general U. S. army) and brevet major-general U. S. volunteers); and A. D. C. to the general-in-chief, rank of colonel, 1866–70. He was superintendent of the geodetic survey of the northern lakes 1870–83; president of the Mississippi river commission Dec. 1, 1882; member of board of engineers for fortification and river and harbor improvements 1882; of board of visitors of Engineer School of Application 1885; member of National Academy of Sciences 1884, etc. Retired, Feb. 2, 1895.

Comstock, George Cary: See the Appendix.

Comstock, Grover S.: preacher; b. at Ulysses, N. Y., Mar. 24, 1809; graduated at Hamilton College, Clinton, N. Y., in 1827; studied law, and admitted to the bar in 1830. Moved by the preaching of Rev. C. G. Finney, he studied theology at the institution at Hamilton, N. Y., and became a Baptist minister; sailed in 1834 as a missionary to British Burma, and finally went to Aracan. In 1837 he founded a church at Kyouk Phyou. In spite of the deadly climate, which carried off his wife and children, he remained here until his death, Apr. 25, 1844.

Comstock, John Henry. B. S.: entomologist; b. at Jaynesville, Wis., Feb. 24, 1849, and educated at Cornell University, where he has been successively instructor in Entomology, assistant Professor and since 1882 Professor of Entomology and General Invertebrate Zoölogy. He is also non-resident Professor of Entomology in Leland Stanford Junior University. From 1879 to 1881 he was U. S. entomologist, and during this time published two official reports as well as a report on cotton insects. Among his more important contributions to entomological literature are a *Monograph of the Diaspinæ* (Ithaca, N. Y., 1883) and *An Introduction to Entomology* (Ithaca, 1888). F. A. Lucas.

Comstock, John Lee: writer on physics; b. at East Lyme, Conn., in 1789; served as an army-surgeon in the war of 1812–15. His work on *Natural Philosophy* is said to have reached a sale of about 1,000,000 copies. Besides numerous works for schools on natural and physical science, he published a *History of the Greek Revolution* (1829) and other books. D. at Hartford, Conn., Nov. 21, 1858.

Comstock Lode: a silver and gold bearing lode situated in the western part of the State of Nevada, in Storey County, at a point about 12 miles N. E. of Carson City, and about 19 miles E. of the California State-line, in lat. (about) 39° 22′ N. and lon. 119° 39′ W. from Greenwich. It lies on the eastern slope of the Virginia Mountains, a nearly due north and south offshoot of the Sierra Nevada, near the base of Mt. Davidson, the loftiest peak of this secondary range, which is 7,827 feet above the sea-level. The most important portion of the lode is included within the limits of Virginia City, which at C Street is 1,635 feet below the sum-

mit of this peak, or about 6,192 feet above the level of the ocean.

According to J. Ross Browne, as well as Henry Degroot (*Overland Monthly*, June, 1873), the discovery of the Comstock lode was a fortuitous occurrence.

The Comstock, though properly characterized as a single lode, is rather a broad metalliferous belt or ore-channel, carrying a congeries of subordinate lodes, bunches, and chimneys of ore, all reposing in as many distinct clefts, separated by "horses" and dikes of porphyry, belts of quartz, seams of clay, making up a body of vein-matter unparalleled for magnitude and complexity in the history of mining.

The ores of the Comstock lode consist chiefly of native gold, native silver, vitreous silver ore (argentite), stephanite, and argentiferous galena imbedded in a quartz gangue. Besides these, ruby silver, horn silver, polybasite, pyrargyrite, and sternbergite occur in small quantities; also iron and copper pyrites, zinc blende, and several carbonates and sulphates.

The productive masses—variously designated as bonanzas, ore-bodies, ore-chambers, chimneys, zones, etc.—are irregular in shape, with a general tendency to a lenticular form, something like a concavo-convex lens. They usually occur in the swells of the vein, and their position is more vertical than the dip of the lode.

Bullion Product.—It is difficult to obtain trustworthy data in relation to the bullion product of the Comstock lode. The amount of precious metals yielded by this group of mines has indeed been enormous, but there is scarcely a doubt but that there has been a tendency to publish exaggerated estimates. The following figures, taken from a careful estimate furnished by Mr. James D. Hague and Mr. J. J. Valentine, and from 1884 to 1889 inclusive by Dr. David T. Day, exhibit, probably, a more accurate statement of the annual bullion production of this lode since the date of its discovery than any that has heretofore been published:

YEAR.	Value of bullion.	YEAR.	Value of bullion.
1860	$100,000	1876	$37,000,000
1861	2,000,000	1877	37,911,710
1862	6,000,000	1878	21,295,043
1863	12,400,000	1879	8,830,562
1864	16,000,000	1880	5,312,592
1865	16,000,000	1881	1,726,162
1866	11,739,100	1882	1,333,018
1867	13,738,618	1883	1,725,486
1868	8,479,769	1884	2,838,752
1869	7,405,578	1885	3,144,602
1870	8,254,272	1886	3,736,218
1871	10,644,704	1887	4,511,231
1872	13,159,093	1888	7,627,268
1873	23,216,062	1889	5,949,923
1874	23,051,496		
1875	24,885,617	Total	$340,016,876

The proportional value of *gold* contained in the bullion product varies from 33 to 70 per cent. In the Big Bonanza it is stated at 42 per cent.; in the product of the Comstock lode for 1876 it is estimated at 46 per cent. In the total product of the lode from its discovery to the end of 1883 the value of the gold can not, therefore, be less than 40 per cent.; hence we have to the end of 1889, adding the actual gold and silver products from 1883 to 1889:

Total bullion product = $340,000,000.
" gold " = 138,160,000.
" silver " = 201,840,000.

By reference to the table it will be seen that the bullion product of the lode attained a maximum in 1864–65, diminished until 1869–70, and then increased again until 1876–77, at which time it reached its second maximum, since which it has rapidly diminished, but has again recovered. In recent years the output has much decreased on account of the development of rich mining districts of both gold and silver in Colorado and elsewhere.

Revised by Charles Kirchhoff.

Comte, kōnt, Isidore Auguste Marie François Xavier: French philosopher and mathematician; founder of the positive school of philosophy (see Positivism); b. at Montpelier, Jan. 19, 1798. He entered in 1814 the Polytechnic School in Paris. He became about 1820 a disciple of Saint-Simon, and contributed articles to his journal *L'Organisateur*, in which the germ of his ideas already appeared. He was intrusted by his master with the preparation of a Saint-Simonian *Politique Positive*, which proved unsatisfactory to the old philosopher. In 1826 he began a series of lectures, soon discontinued by a cerebral derangement, but resumed in 1828; tutor of mathematics and examiner of candidates at the Polytechnic School 1832–52. Comte's central thought is the idea of the evolution of humanity. There are three steps of intellectual development for the race: (1) theological, (2) metaphysical, (3) the positive. In the first stage man refers all phenomena to the immediate action of some supernatural being; in the second to some abstract force or essence; in the third he no longer seeks a cause or essence beyond the phenomena, but is content with discovering laws of uniform action—that is to say, with the reduction of particular facts to more general facts. He lived obscurely, with straitened means, and died Sept. 5, 1857. His writings were *Cours de Philosophie Positive* (6 vols., Paris, 1830–42), and *Système de Politique Positive, ou Trinité de Sociologie, Instituant la Religion de l'Humanité* (1851–54); besides *Calendrier Positiviste* (4th ed. 1852), and *Catechisme Positiviste* (1853). A clearer exposition of his doctrines is contained in Littré's *Comte et la Philosophie Positive* (1863). His *Cours*, etc., was published in English in a condensed form by H. Martineau (2 vols., 1853). See Robinet, *Notice sur l'œuvre et sur la vie de Comte*, and Lewes, *Exposition of the Principles of the Positive Philosophy*.

Revised by W. T. Harris.

Comte, Pierre Charles: genre and historical painter; b. at Lyons, Apr. 23, 1823. Pupil of Delaroche, Horace Vernet, and Robert Fleury; second-class medal, Paris Exposition, 1855; third-class medal, Paris Exposition, 1867; Legion of Honor 1857. His work is scholarly and possesses good qualities of color and drawing. *Henri III. and the Duc de Guise* (1885) is in the Luxembourg Gallery; *Scene at Fontainebleau* (1874) at the Corcoran Gallery, Washington. D. at Fontainebleau, France, Nov. 29, 1895. W. A. C.

Co'mus (in Gr. Κῶμος): originally, the Greek name of those songs of carousal which young people would sing when passing the houses of their friends or lovers. Thence it became the name of the god of such revel; and Philostratus gives a description of a picture in which Comus was represented as a youth, drunken, sleeping, leaning forward on a down-turned torch. Milton makes him a foul sorcerer, the son of Bacchus and Circe.

Conant, Roger: colonist; b. in Devonshire, England, in 1593; settled in Plymouth colony in 1623; founded Salem, Mass., in 1626, and became a justice of the quarterly court. D. Nov. 19, 1679.

Conant, Thomas Jefferson, D. D.: b. at Brandon, Vt., Dec. 13, 1802; graduated at Middlebury College in 1823; Professor of Greek, Latin, and German in Waterville College (now Colby University) 1827–33, and appointed in 1835 Professor of Biblical Literature in the Theological Seminary at Hamilton, N. Y. From 1850–57 he occupied a similar position in the Theological Seminary at Rochester, N. Y. In 1857 he resigned, and from thence till 1877 was in the service of the American Bible Union, and brought out their revision of the New Testament and of portions of the Old. In 1839 he published a translation of Gesenius's *Hebrew Grammar*; in 1856 a new version, with notes, of *The Book of Job*—a work which has attained a European reputation; *βαπτίζειν, its Meaning and Use Philologically and Historically Investigated* (New York, 1864). By common consent he was one of the most accomplished Hebraists in America. D. in Brooklyn, N. Y., Apr. 30, 1891.

Cona'rium [from Gr. κωνάριον, from κῶνος, a corn]: a name formerly in vogue for the pineal gland. See Parietal Eye.

Concan: a maritime tract of Western India. See Konkan.

Concave [from Lat. *con'cavus*, hollowed out; *con* + *cavus*, hollow]: a curve is said to be *concave* at a given point when the lines joining the latter to adjacent points on the curve fall between the spectator and the curve, and *convex* when the curve is interposed between the spectator and the small chords in question. A surface is said to be concave or convex at any point when the plane sections through that point and the spectator's eye are all concave or convex; when some of these sections present their concavity and others their convexity to the spectator, the surface is sometimes said to be concavo-convex. This is the case with the hyperboloid of one sheet. When at a point on a curve the center of curvature and the point of view fall on the same side of the tangent, we have concavity; when on opposite sides, convexity. See Lens.

Concealment: in law, the suppression of the truth to the injury of another who has a legal right to know and rely upon the truth. A distinction is taken between such facts as are extrinsic to the contract, such as the existence of war or peace, and those which are intrinsic. Concealment of extrinsic facts is not, in general, fraudulent. See FRAUD.

Revised by F. STURGES ALLEN.

Concepcion: a maritime province of Chili; bounded by Maule on the N., Nuble on the E., and Bio-Bio on the S. Area, 3,535 sq. miles. It is traversed by the Bio-Bio. The climate is mild and favorable for tillage and pasturage. Wheat and wine are the staple agricultural products, and there are important coal mines. Pop. (1895) 188,190.

Concepcion: a town of Paraguay; capital of a department of the same name; on the Paraguay river, 135 miles above Asuncion, and just within the tropic of Capricorn (see map of South America, ref. 6-E). Pop. (1887) estimated, 9,950.

Concepcion del Urugnay, or simply **Urugnay**: a city of Argentina, province of Entre Rios, on the river Uruguay (see map of South America, ref. 8-E). It is connected by railroad with Paraná, and has a large trade in grazing products; the salting establishments, built by Gen. Urquiza, are among the largest in Argentina. Concepcion was formerly the capital of the province, and is still the episcopal town. The deserted palace and immense estates once owned by Urquiza are near the town. Pop. 10,000. H. H. S.

Concepcion, La: a city of Chili; capital of the province of Entre Rios; on the river Bio-Bio, 7 miles from its mouth; lat. 36° 49′ S. (see map of South America, ref. 9-C). It is a bishop's seat and the terminus of a railway system. The port, Talcahuano, 8 miles distant, is one of the best in Chili, having an extensive foreign trade and exporting large quantities of hides and tallow. Concepcion was founded by Valdivia, Oct., 1550; destroyed by Araucanian Indians 1555; refounded by Garcia Hurtado de Mendoza 1557. It was ruined by earthquakes in 1730, 1752, and 1825. Pop. (1885) 24,000; (1895) 39,837.

Concept [from Lat. *conceptum*, something conceived, brought together and grasped; *con*, together + *ca'pere*, take]: in metaphysics, a thing which may be conceived; a collection of attributes united by a sign, and representing an object of possible intuition. Kant and his followers use the word concept to indicate notions which are general without being absolute. They divide these into three different classes: "Pure concepts," which derive nothing from experience; "empirical concepts," wholly derived from experience; "mixed concepts," ascribable partly to experience and partly to the pure understanding. A concept is "clear" when its object can be distinguished from any other; "distinct," when its component parts can be defined.

Conception [from Lat. *conceptio*, deriv. of *conci'pere*, gather together and take, take and hold, take effectively; *con*, together + *ca'pere*, take]: in psychology, the last, finishing process by which consciousness takes possession of an object. It is distinguishable from sensation as active from passive. As long as an object is allowed to impress the mind through the senses, immediately and directly, without any reaction or interference from the side of the mind, consciousness is in a merely passive state; and this passive state of consciousness is called sensation. In order to master an object, the mind can not stop, however, at the mere sensation; it must make the sensation itself the subject of a scrutiny and discrimination; and this active part of the whole psychological process by which the mind takes possession of an object is called perception and conception; the former referring to the sensation as representing the details of the object, the latter as involving the whole of it. As we go over an object with the finger-tips to ascertain the exact position and relations of its outlines, thus perception runs over all the outlines given in the sensation, partly verifying their truth with respect to the object, partly lifting them into perfect clearness of consciousness. Conception does not begin its work until perception is through with its task. The mode and the meaning of an object as a whole is the task of conception, and thus the conception of an object corresponds very nearly to that which we generally call a view of the object; with this difference only, that a view always is understood to be more or less influenced by the individuality of the subject, while the conception always is supposed to be, strictly and scientifically, the subjective equivalent for the idea of the object. The difference between conception and imagination is simply that conception is a process and imagination a faculty; in the process of conceiving the faculty of imagination is very largely used.

Conception, in physiology: See EMBRYOLOGY.

Conception, Immaculate, Doctrine of the: See IMMACULATE CONCEPTION OF THE VIRGIN MARY.

Conception, Orders of the Immaculate: Among the orders of the Roman Catholic Church there have been the following: (1) The Knights of the Immaculate Conception of the Blessed Virgin, an order founded in 1618, at Vienna, with the intention of bearing arms against heretics and infidels. The institution was confirmed by Pope Urban VIII. in 1623, but the brotherhood did not flourish, and soon was extinct. (2) The Nuns of the Immaculate Conception of Mary, founded at Toledo, in Spain, in 1484, by Beatrix de Sylva, and confirmed by Pope Innocent VIII. in 1489. They afterward joined the Clarisses, and took their rule, which rule was changed by Pope Julius II. in 1511. They are often called Conceptionists. (3) The Congregation of the Immaculate Conception of the Blessed Virgin is the appellation of the lay sisters attached to the nuns of Notre Dame, who were established by the blessed Peter Fourier (1565–1640).

Conceptualism: a doctrine of the Schoolmen intermediate between realism and nominalism. The Realist asserts that genera and species have an independent existence—that there exist certain "ideas," the pattern after which single objects are fashioned. The Nominalist asserts that nothing exists but things and names of things—that universals are mere names. The Conceptualists assign to universals an existence which may be called psychological—that is, independent of single objects, but dependent on the mind of the thinking subject in which they exist as conceptions. Abelard is considered the founder of this doctrine, which was held by Reid, but the distinction arises from a misconception of the doctrine of REALISM (*q. v.*), and is, after all, only NOMINALISM (*q. v.*).

Concertina, kon-sėr-tee'na: a musical instrument invented by Sir Charles Wheatstone in 1829. It is hexagonal in shape, with a keyboard at each end and an expansible bellows between the two. The air from the bellows pressing on free metallic reeds produces the sound, and this is effected both by drawing out and by pressing the bellows, the same note resulting in each case. The compass of the treble concertina is four octaves, through which there is a chromatic scale.

Concer'to: in music, (1) a composition for two or more instruments of the same or of a different kind, or (2) for a single instrument accompanied by an orchestra, designed to show the skill of an executant. The modern concerto was invented by Giuseppe Torelli in 1686. Its form was finally settled by Mozart.

Concetti, kon-chet'tee [plur. of Ital. *concetto*, a conceit, a fanciful notion or expression < Lat. *conceptus*]: ingenious thoughts or turns of expression, points, *jeux d'esprit*, etc., in serious composition. In the sixteenth century the taste for this species of brilliancy, often false, and always dangerous, spread rapidly in the poetical composition of Europe; and toward the end of the century famous representatives of the tendency appeared in at least three countries, i. e. Lyly (author of *Euphues*) in England, Gongora in Spain, and Marino in Italy. Each gave a name to the style—Euphuism, Gongorism, Marinism. During the early part of the seventeenth century literature was everywhere afflicted by the passion for concetti, as witness Filicaia in Italy, the Hôtel Rambouillet and the Précieuses in France, and Donne and Cowley in England. Revised by A. R. MARSH.

Conch, kongk, or **Conch-shell**: the shell of certain carnivorous gasteropods of the genera *Triton*, *Strombus*, etc., found chiefly in tropical seas. Many tons of these shells are annually exported from the Bahamas to Europe, where the finest are used in cutting shell-cameos, and the rest are useful in the porcelain manufacture.

Concha, José. de la, Marques de la Habana: Spanish general and statesman; b. at Cordova, viceroyalty of Buenos Ayres, 1809. His father was shot in the revolution of 1814, and his mother took him to Spain, where he entered the army. In the Carlist struggles he attained the rank of lieutenant-general (1839); was captain-general of the Basque provinces 1843–46 and of Cuba 1849–52; on his return joined the oppositionists, and was exiled for a time; was again cap-

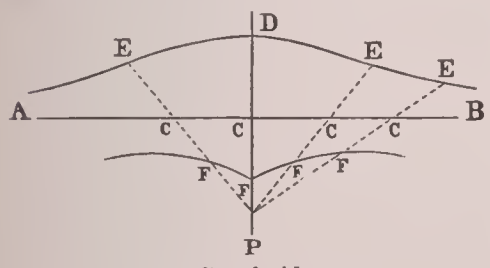
tain-general of Cuba 1854–59; on his return became senator and subsequently minister to France (1862); was Minister of War in the Miraflores cabinet 1863, and president of the senate 1864, having also attained the military grade of marshal, though he had seen little active service. In Sept., 1868, Queen Isabella, then in France, appointed him president of the council and Minister of War and Marine; but he was forced to resign by the revolution of Sept. 28, which overthrew the monarchy. He retired for a time to France, and by his own request on his return was again made governor-general of Cuba (Apr., 1874), but he was unsuccessful against the revolutionists there, and was relieved in Mar., 1875. During his administrations of Cuba he was accused of encouraging the slave-trade. He published two works on the political condition of the island. HERBERT H. SMITH.

Concha, Don MANUEL GUTIÈRREZ, de la, Marques del Duero: brother of Don José Concha; b. in Madrid, 1794. He was educated for the army; made his first campaigns in the war against Napoleon; served against the revolution in Buenos Ayres 1816–24, afterward against the Carlists; was made a general in 1839 and field-marshal in 1840. In politics he belonged to the moderate and conservative party. Nevertheless, in 1853 he, together with O'Donnell, Bravo, Soto, Mayor, and others, issued that address to the queen which led to the revolution. After the fall of the queen he retired for some time into private life. He was serving with great success at the head of the republican army against the Carlists when he fell in the battle of Muro, June 28, 1874.

Conchifera, kong-kif'*e*-ra [from Lat. *concha*, bivalve (Gr. *κόγχη*) + *ferre*, bear]: in Lamarck's arrangement of mollusks a class containing those which have bivalve shells, including also the *Brachiopoda*. The term is now used to indicate the class usually called *Acephala*, but it does not include the *Brachiopoda*. In Gegenbaur's classification the term is used to include all mollusks save the Chitons, the mollusca of authors generally. F. A. L.

Conchoidal: shell-like; used in mineralogy to describe a variety of fracture. When the fractured surface of a mineral exhibits curved concavities similar to the valve of a bivalve mollusk, it is said to have a conchoidal fracture, as flint, anthracite coal, etc.

Conchoid of Nicomedes [*conchoid* is from Gr. *κογχοειδής*, mussel-like; *κόγκη*, mussel + *εἶδος*, appearance]: a curve of the fourth degree, invented by Nicomedes as a means of trisecting an angle, of constructing two geometrical means between two given straight lines, and of finding a cube double a given cube. The curve may easily be described, and is occasionally used in architecture as a bounding line of the meridian section of columns. It is generated as follows: Let A B be a straight line, and P any point not upon it; then if lines P E, P E′, etc., be drawn, cutting A B, which is called the directrix, in points C C′, and let C E, C F be laid off from the points of intersection, each equal to a given line, the curves traced by the successive points E and F form the conchoid. That branch which is most remote from P (the "pole" of the conchoid) is called the first or superior conchoid, and the other branch, traced by points F F′, is the second or inferior conchoid. Both branches may extend to infinity, and they have the line A B for a common asymptote. The constant distance C E of the points E and F from the points of intersection is called the modulus of the curve. If we take C in the line D P as origin, and the lines A B and D P, at right angles to one another, as co-ordinate axes, the equation to the conchoid is $x^2 = \frac{(b+y)^2(a^2-y^2)}{y^2}$, where a is the modulus of the curve, and b = the perpendicular distance of P from A B. If $a = b$, P becomes a cusp point of the first species.



Conchoid.

Conchology [from Gr. *κόγχη*, mussel, shell + *λόγος*, word, reason]: that branch of natural history which treats of the shells of mollusks and similar animals. See MOLLUSCA.

Conchos, kon'chōs: a river of Mexico, an affluent of the Rio Grande; flows through the state of Chihuahua. Its general direction is N. N. E. Length about 330 miles.

Conclave [from Lat. *concla've*, an apartment that may be locked; *con*, together + *cla'vis*, key]: the apartment in which the cardinals of the Roman Catholic Church assemble to elect a new pope, or more frequently the assembly itself. When a pope dies, nine days are allowed for the funeral solemnities. The cardinals assemble on the tenth day, and voting begins on the eleventh. The large halls of a papal palace in Rome or the city where the pope dies are so divided by wooden partitions as to furnish a number of sets of small apartments, all opening upon a corridor. All the entrances to the building are closed but one, which is given in charge to officials. No intercourse with the public is held while the election is going on. From their separate cells, or rather wooden stalls, the cardinals come together twice a day till some one of their own number is made pope by a majority of two-thirds of all the votes. Each cardinal is attended by one or two waiters, called *conclavists*, sworn to secrecy like the cardinals. This method, in its main features, dates from 1273, a constitution, known as that of Gregory X., regulating the mode of electing the pope, having been carried in the Œcumenical Council of Lyons, July, 1273. Since Gregory XV. (1621–23) the choice has been either by scrutiny (ballot), by quasi-inspiration, or by compromise, usually the first. The scrutiny, or voting by ballot, is performed by means of specially prepared voting-papers, which conceal the name of the voter. See S. B. Smith, *Elements of Ecclesiastical Law* (6th ed. New York, 1887). See CARDINAL. Revised by JOHN J. KEANE.

Concomitance, Sacramental: the doctrine of the Roman Catholic Church that the body and blood of Christ *sacramentally accompany* each other, so that *both* are *sacramentally* received under *either* species, whether of bread or wine; hence that the communion in one kind imparts all that is received sacramentally in both kinds. Aquinas substituted this term for the older one, "Unio naturalis." *Catholic Dictionary*, s. v. *Eucharist*, and the article TRANSUBSTANTIATION. JOHN J. KEANE.

The Lutheran Church maintains that from a *natural* concomitance we can not argue to a *sacramental* one, which is wholly supernatural and dependent on the will of Christ; that this doctrine implies that the officiating priest receives both body and blood twice; and that it holds equally good for *one kind* in the sacrifice of the mass. See Krauth's *Conservative Reformation* (620, 621).

Concom'itant [from Lat. *conco'mitans*; pres. ptc. of *concomita'ri*, accompany; *con*, together + *comita'ri*, attend as companion, deriv. of *comes*, *co'mitis*, attendant]: in modern algebra a quantic which is related to a given system of quantics in the following manner: Let u, u_2, etc., be a given system of quantics, which by linear transformation of their variables become converted into u'_1, u'_2, u'_3, etc., and let u and u' be quantics respectively derived from these two systems according to the same definite rule; then if u is converted into $m\,u'$, where m denotes some power of the modulus of transformation, by the same or by reciproeal systems of linear transformations of its variables or facients, u is said to be a concomitant of the given system u_1, u_2, etc. If u should contain no variables, and be therefore identically equal to $m\,u'$, it is called an invariant of the given system of quantics; if, containing variables, it should be converted into $m\,u'$, by the same linear transformations, it is called a covariant; but if its conversion into $m\,u'$ should require linear transformations reciprocal to those first employed, it is called a contravariant. Lastly, if u should contain two sets of variables, and still become converted into $m\,u'$ by transforming one set by the original and the other by the reciprocal substitutions, it is called a mixed concomitant of the given system of quantics. Concomitants therefore embrace covariants and contravariants.

Concord: town of Middlesex co., Mass. (for location of county, see map of Massachusetts, ref. 2–H); on Bos. and Me. and Fitchburg R. Rs., and on the Concord river; 20 miles N. W. of Boston. Incorporated in 1635, it was the first settlement in New England not on the coast. The first Provincial Congress of Massachusetts assembled in its old church Oct., 1774, and made the town the place of deposit for the military stores of the colony. On Apr. 19, 1775, at the North Bridge, in an affair known as Concord Fight, a body of American soldiers, organized under legal authority, advanced against British troops, who had been sent to seize those stores, received their fire, by command of their officers returned it, forced the enemy to retreat, and by this first attack under military orders upon the soldiers of the king

began the war of the Revolution. Concord was the home of Alcott, Emerson, Hawthorne, Thoreau, and other persons of literary distinction. It has a high school, a fine public library, and manufactures of cotton and woolen flannels and of wooden-ware. The State prison is in the western part of the town. Pop. (1880) 3,922; (1890) 4,427; (1900) 5,652.

Concord: city; capital of Merrimack County, and of the State of New Hampshire (for location of county, see map of New Hampshire, ref. 8-F); is pleasantly situated on the W. bank of Merrimack river; 75 miles by rail N. N. W.

State Capitol, Concord, N. H.

from Boston; lat. 43° 12′ 20″ N., lon. 71° 29′ W. It is one of the largest railroad centers in New England. It has an area of 64 sq. miles, with gas and electric lights, a generous supply of aqueduct water for all purposes, a complete system of sewerage, electric fire-alarm, steam fire department, etc.

Streets and Public Buildings.—The streets are wide, have fine sidewalks, and are beautifully shaded. The State-house was built of Concord granite at a cost of $250,000, and contains collections of portraits of the State's distinguished sons. The State library building (costing $300,000) contains a large law and reference library, chambers of the supreme court, offices of State departments of education and agriculture, a collection of New Hampshire minerals, and a valuable portrait gallery. The court-house and city-hall cost $45,000. New Hampshire Historical Society library has a large collection of books, pamphlets, and historical pictures. The city contains the State asylum for the insane, a State prison, a Government building for post-office, pension-office, U. S. courts, etc., an orphans' home, an opera-house, and other public halls.

Manufactures.—The most important manufactures are of granite quarried and dressed, carriages, belting and leather hose, foundry and machine work, harnesses, flour, woolen goods, cotton goods, tanned leather, pianos, shoes. The B. and M. railroad has large car manufacturing and repair shops here. The water-power is valuable.

Churches, Education, etc.—The several religious denominations are represented by 25 churches. Concord has graded schools and high schools fitting pupils for college, St. Paul's, a noted Episcopal training-school for boys, a good public library, 2 daily and 3 weekly newspapers, and a monthly magazine.

Finances.—It has 3 national and 4 savings banks. Valuation of the city, $11,000,000.

History.—This place was the headquarters of the Penacook tribe of Indians, under Passaconway, who were friendly to the English. It was granted by Massachusetts as Penacook in 1725; incorporated Rumford in 1730; came under the jurisdiction of New Hampshire, and was incorporated Concord in 1765; became State capital in 1816; shire-town of Merrimack County in 1823, and adopted city charter in 1853. A bronze statue of Daniel Webster, presented by Benjamin P. Cheney to the State of New Hampshire, was unveiled in the State-house park June 17, 1886. A companion statue of John P. Hale, presented by William E. Chandler, was erected in 1892. In 1890 the State erected a statue of Gen. John Stark. Pop. (1870) 12,241; (1880) 13,843; (1890) 17,004; (1900) 19,632. EDITOR OF "EVENING MONITOR."

Concord: city; capital of Cabarrus co., N. C. (for location of county, see map of North Carolina, ref. 3-E); on Rich. and Danv. R. R., 20 miles N. E. of Charlotte. It has a cotton factory and two public gins, iron manufactories, foundry, machine-shops, etc.; large mines are in the vicinity. Pop. (1880) 1,264; (1890) 4,339; (1900) 7,910.

Concordance [from Late Lat. *concordantia*, deriv. of *concordans*, pres. ptc. of *concorda're*, agree; *concors*, of one mind; *con*, together + *cor*, *cordis*, heart]: an index or dictionary in which all the important words used (*verbal* concordance) or subjects treated of (*real* concordance) in any work are arranged alphabetically, and reference made to the places where they occur. Of biblical concordances the number is very large. The earliest real concordance was to the Vulgate by Antony of Padua (b. in 1195; d. in 1231 A. D.); the first verbal one by Cardinal Hugo de S. Caro (1244). Next in order was the Hebrew concordance of Rabbi Isaac Nathan (finished in 1448, published in Venice 1524). The first Greek concordance to the New Testament, by Xystus Betuleius (whose real name was Birck), appeared in Basel, 1546. Conrad Kircher's concordance to the Septuagint appeared in 1607 in Frankfort, and was the first of its kind. The best are—for the Hebrew, Fürst (1840); for the New Testament Greek, K. H. Bruder (Leipzig, 1842); for the Septuagint, Trommius (1718), which will be superseded by Edwin Hatch and H. A. Redpath (London and New York, 1892, *sqq.*); for the Vulgate, F. P. Dutripon (Paris, 1838; 7th ed. 1880). The first English concordance was by John Marbecke (London, 1550); the best by Alexander Cruden (1737), Robert Young (Edinburgh and New York, 1879; n. e. 1892), and James Strong. The *Englishman's Greek Concordance to the New Testament* (London, 1840; 5th ed. 1868) is very valuable; also Thom's *Concordance to the Revised New Testament* (1833). Among the chief concordances to the German Bible are those of Lanckisch (Leipzig, 1677); Schott (1827), and Hanff (1828–34), but the German Cruden is Gottfried Büchner (Jena, 1740; 20th ed. Brunswick, 1890). There is a French concordance by Mark Wilks (Paris, 1840). There is a concordance to Shakspeare by Mrs. Mary Cowden Clarke (1845), and to Tennyson by D. B. Brightwell (1869). And there are concordances to Milton and Pope. The special lexicons, as to Homer by Crusius, and to Plato by Ast, are essentially concordances. See DICTIONARY.

Concor'dat [Fr., from Lat. *concorda'tum*, thing agreed upon, past ptc. of *concorda're*; *con*, together + *cor*, *cordis*, heart]: a treaty between the pope as head of the Roman Catholic Church and a civil government in relation to all or some of the ecclesiastical affairs of the Roman Catholic Church in the respective state. Usually the subjects treated of in concordats are those which have at once a civil and a religious aspect, hence called "mixed" matters, though purely temporal and purely spiritual matters are occasionally contained in them. The concordat is sometimes published by a papal bull, followed by the ratification of the respective state, sometimes by a formal treaty signed by the plenipotentiaries of the contracting parties. They are generally looked on as international contracts or treaties, binding on either side, but revocable by either party when the express conventions are violated, when their fulfillment is physically or morally impossible, etc. The most famous of the ancient concordats are (1) the Concordat of Worms (*Pactum Calixtinum*, 1122) between Pope Calixtus II. and Emperor Henry V., by which the quarrel of the investitures was ended. The emperor gave up his claim to invest with ring and crozier, and allowed the full liberty of episcopal elections and consecrations, while the pope conceded that the episcopal elections should take place in presence of the emperor, exclusive of force and simony; the disputed elections to be settled by the emperor after hearing the judgment of the respective provincial bishops. The elect could be invested by means of the scepter, in Germany before, in Burgundy and Italy after, the consecration. (2) The Concordats of Constance, made by Martin V. in 1418 with the representatives of the German (inclusive of Poland, Hungary, Scandinavia), the French (inclusive of Spain and Italy), and the English nations. In these concordats were treated the special reform demands of these nations; a number of general decrees had been shortly before issued and agreed to by all. (3) The Concordat of Feb., 1447, between Eugene IV. and the imperial Electors of Germany. (4) The Concordat of Vienna (or Aschaffenburg), of Feb., 1448, between Nicholas V. and the imperial estates, in imitation of the Concordat of Constance. (5) The Concordat of Leo X. and

Francis I. (1516), by which the Pragmatic Sanction of Bourges was abolished and an overwhelming influence in French ecclesiastical affairs granted to the young king, which both he and his successors abused, though at the beginning the parliaments and the university were opposed to this concordat.

The principal modern concordat is that agreed upon in 1801 between Pius VII. and Napoleon I., in seventeen articles, which recognizes the Roman Catholic religion as that of the great majority of French citizens, provides for the free exercise of Catholic worship, the salary of its ministers, etc. The pope, on his side, recast the hierarchy in France, accorded to the first consul the right of indicating candidates for the episcopal sees, reserving to himself the canonical institutions, and renounced the claims of the Church to the confiscated ecclesiastical goods. This concordat does not hold good in case the head of the French Government should cease to be a Roman Catholic. The holy see does not recognize the "organic articles" added in 1802 by Napoleon. A new concordat was projected in 1817 between Pius VII. and Louis XVIII., but failed to receive the confirmation of the assembly. Since the beginning of the nineteenth century the holy see has made concordats with Bavaria (1818), Prussia (1821), Baden (1827, 1859), Hanover (1824), Oldenburg (1830), Würtemberg (1857). Sardinia, Naples, Tuscany, Spain, the Netherlands, Switzerland, and Russia have also made concordats with Rome in the course of the nineteenth century. The Austrian Concordat of 1855, which aimed at being favorable to the Catholic Church, was vehemently opposed as too favorable to the Church. It was abolished by the Government in 1870. Special arrangements in 1881 permitted the regulation of the Catholic hierarchy in Bosnia and Herzegovina. The South American republics have concluded concordats with the Roman Catholic authorities: Venezuela (1862), Ecuador (1862), Bolivia (1851), Guatemala (1852), San Salvador and Honduras (1862), Nicaragua (1861), Costa Rica (1852), Haiti (1860). In these concordats the Roman Catholic religion is recognized as the religion of the state, without exclusion of other cults, the support of the clergy provided for, the freedom of Roman Catholic worship guaranteed, while the president can name the candidates (within a year) for vacant bishopries, and in the case of vacancies of parishes three candidates who have previously sustained the Tridentine concursus are proposed to the president, who can choose one of the candidates for the parish.

The text of the concordats is to be found in Walter, *Fontes Juris Ecc. Antiq. et Moderni* (Bonn, 1862); Nussi, *Conventiones de rebus ecc. inter S. Sedem et Civitem potestatem* (Mayence, 1870). See Balve, *Das Concordat* (Munich, 1863). For the Roman Catholic view of the many intricate questions, see Wetzer and Welte's *R. Lexicon*, art. Concordat; for the Protestant, Richter and Dove's *Kirchenrecht* (8th ed. 1878). JOHN J. KEANE.

The term is also applied to the covenant entered into by the Scottish bishops Skinner, Kilgour, and Petrie with Seabury at the time of the latter's consecration as the first Bishop of Connecticut, Nov. 14, 1784, at Aberdeen, Scotland. This ecclesiastical State paper is printed in full in Hawks and Perry's *Conn. Ch. Documents*.

Concord, Book of: the collection of the Confessions which are received either by the entire Lutheran Church or by the larger part of it. It was published in 1580, and supplanted a great number of bulky Corpora Doctrinæ. It contains—1, the three General Creeds (the Apostles', Nicene, and Athanasian); 2, the Augsburg Confession; 3, the Apology of the Confession; 4, the Smalcald Articles; 5, the Smaller and the Larger Catechism of Luther; and 6, the Formula of Concord, to which the *Book of Concord* is related as the whole to a part, though the two are often confounded. An English translation of the *Book of Concord* in two volumes, the second consisting of historical introduction, illustrative documents, and indexes, edited by H. E. Jacobs, was published in Philadelphia 1882–83.

Revised by HENRY E. JACOBS.

Concord, Formula of: the last part of the *Book of Concord*, in which it appeared, for the first time, in 1580. It consists of two parts, of which the first may be said to be the text and the second the commentary. It was occasioned by the vacillations of MELANCHTHON (*q. v.*), real and seeming, the Crypto-Calvinistic and other controversies, and the appearance of a number of Corpora Doctrinæ objectionable in various respects. Protracted and patient conferences and labors, in which the greatest divines of the Lutheran Church, especially Andreæ and Chemnitz, took part, preceded and accompanied the preparation of it. Eighty-six of the states of the empire united in it. Augustus of Saxony was among its most important promoters.

Revised by HENRY E. JACOBS.

Concor'dia: a goddess of the Roman mythology; may be considered a personification of domestic concord and of harmony between several classes of the body politic. Several temples were erected to her in ancient Rome. The sessions of the senate were sometimes held in the Temple of Concord (*Ædes Concordiæ*).

Concordia: village; 35 miles N. E. of Venice; on the site of the old city of Concordia; founded by Augustus after the pacification of the empire, and destroyed by Attila in 452 (see map of Italy, ref. 3–E). In 1873 the old Christian cemetery of the city was discovered, and 160 stone coffins, some of great archæological interest, were dug up.

Concordia: a city of Argentina; in the province of Entre Rios; on the river Uruguay, nearly opposite Salto (see map of South America, ref. 8–E). Steamers ascend the river to this point, and the East Argentine Railway connects it with the agricultural and grazing districts of Corrientes, being a large and constantly increasing trade. Pop. (1889) 11,500, and rapidly growing. H. H. S.

Concordia: city (founded in 1870); capital of Cloud co., Kan. (for location of county, see map of Kansas, ref. 4–G); on Mo. Pac., Atch., Top. and S. Fé and Un. Pac. R. Rs., and on the Republican river. It has a U. S. land-office, Nazareth Academy, a high school, iron-works, plow, wagon, and cigar factories, roller flouring-mills, excellent water-power, etc. Pop. (1880) 1,853; (1890) 3,184; (1900) 3,401.

EDITOR OF "CONCORDIA EMPIRE."

Concord River: a river of Middlesex co., Mass.; formed by the junction of the Assabet and Sudbury rivers, at Concord. It flows northward, and enters the Merrimac near Lowell.

Con'crete [from Lat. *concre'tus*, solidified; past ptc. of *concres'cere*, grow together]: in philosophy, said of any quality which is considered in connection with the object to which it belongs; a quality not concrete is abstract. Thus "wisdom" is an abstract quality; but when we speak of a "wise man" the quality becomes concrete.

Concrete: a hardened mixture of mortar (generally hydraulic) with coarse materials, such as fragments of brick or stone, gravel, pebbles, or shells. The volume of mortar should be slightly in excess of the volume of voids in the coarse materials. Among engineers in the U. S. it is customary, in making concrete by hand, to (1) mix the cement and sand, or cement, lime, and sand, together, dry; (2) then add water, and mix to a stiff mortar; and (3) then spread the mortar evenly over the platform; (4) the coarse fragments are then spread out upon the mortar, and the whole mixed together thoroughly with shovels. The coarse materials should be kept damp, or sprinkled with water before they are incorporated with the cement and sand. After mixing the concrete is conveyed away in wheelbarrows, and compacted in position by ramming in layers 6 inches to 8 inches thick. Concrete should not be mixed with too much water, but when ready for use should be quite coherent, and capable of standing at a steep slope without the water running from it; otherwise it will be impossible to compact it by ramming. It should not be plastic and jelly-like under the rammer.

In carrying on large operations it is advantageous, on many accounts, to make the concrete in a mill, of which there are several kinds. Any box or cylinder to receive the ingredients, revolving slowly about either a diagonal or concentric axis, will answer the purpose. A cubical box, measuring 4 feet in length on each edge, was used upon the fortifications on Staten Island with entire success. The box was rigidly mounted upon an iron axle passing through opposite diagonal corners, and was provided with a trap-door, about 2 feet square, close to one of the angles farthest from the axis, through which the materials were introduced. Eight revolutions of the box, made in less than one minute, were found to be quite sufficient to secure a thorough incorporation of the mortar with the coarse material (broken stone and pebbles). In using a mill of this description it is not necessary that the mortar should be first prepared by a distinct and separate process, but all the ingredients of the concrete—the cement, lime (if lime be used), sand, water, and

coarse materials—may be introduced promiscuously into the box. The mill may be charged by wheelbarrows from a platform arranged at the proper height, or preferably by a large tub manœuvered by a derrick. The proper charge for the box, in order to insure thorough mixing, should not exceed one-half to five-eighths of its total capacity. One tub-ful (36 to 40 cubic feet) should charge the box.

A standard formula for making Rosendale cement concrete upon U. S. public works is—

Concrete No. 1.

1 barrel of cement } = 3·27 barrels of concrete mortar;
3 " " sand }
5 " " broken stone, or brick, gravel, oyster-shells, or a mixture of two or more of them.

This batch will make 21·75 cubic feet of concrete rammed in place. The mortar of this concrete, tested by itself, possesses a crushing strength of 130 lb. per square inch when two months old, the test being applied to 5-inch or 6-inch cubes. For unimportant works, 6 to 6½ barrels of broken stone, instead of 5, may be incorporated, and the concrete may be cheapened still further by replacing a portion of the cement by common lime, as in No. 2.

Concrete No. 2.—In foundations above water the concrete mortar may be composed as follows:

1 barrel of Rosendale cement = 3·70 cubic feet of paste,
⅓ " " common lime = 2·50 " "
3½–4 bbl. " sand, loosely measured.

The concrete should contain 1 volume of this mortar to about 2½ volumes of ballast.

Concrete No. 3.—Portland cement concrete possessing a little more strength than the No. 1 above may be made as follows:

1 barrel of Portland cement } = 10·37 barrels of concrete mortar;
1 " " slaked lime-powder }
10 " " sand }
16 " " broken stone or other good ballast.

This batch will produce 69½ cubic feet of concrete rammed in position. The mortar of this concrete will sustain a crushing weight of 154 lb. to the square inch when two months old.

Omitting the common lime, the following formula will give a good concrete:

Concrete No. 4.

1 barrel of Portland cement } = 5·4 barrels of concrete mortar.
5½ " " sand }
6 " " gravel and pebbles } = 12½ barrels mixed and shaken down, containing 26½ per cent. of voids.
9 " " broken stone }

This batch of concrete produces 50 cubic feet rammed in position, and is suitable for the best quality of concrete work.

It is desirable in all cases that the mortar for concrete should be hydraulic, in order to secure simultaneous induration throughout the entire mass after it has been compacted in position. Having established the quality of the mortar, whether of cement and sand, or cement, lime, and sand, the proportion of mortar to the coarse materials should be adjusted, so that the volume of the former should be somewhat in excess of the volume of voids in the latter.

In building the Mississippi jetties blocks of concrete were used which weighed from 25 to 72 tons each. The materials in this concrete were 9·6 per cent. of Portland cement, 27·1 per cent. of sand, 14·5 per cent. of clean gravel, and 48·8 per cent. of broken stone. After setting, the volume of the concrete was only 60 per cent. of the dry materials, and the contraction during hardening was 4 per cent.

The word *beton* is sometimes used as synonymous with concrete, but strictly beton is merely hydraulic mortar, in which the cement and sand have been thoroughly mixed by prolonged trituration when wet.

Concrete is extensively used for the foundations of piers, buildings, and street pavements, and for the general purposes of a rough artificial stone. Monolithic structures in the shape of abutments, arches, and walls of factories, have been built *in situ* and wholly of concrete. For instance, the lower part of the pedestal of the statue of Liberty in New York harbor is a solid mass of concrete 91 feet square at the base, 65 feet square at the top, and 52 feet in vertical height. Concrete can be deposited under water by inclosing it in paper bags which burst when thoroughly wet, and sometimes it is allowed to slide down through the water in a long box or tube, called a *trémie*.

The ultimate compressive strength of concrete ranges from 700 to 3,000 lb. per square inch when two years old. Like cement, it is supposed to harden and strengthen with age. Its cost ranges from $2 to $10 per cubic yard, depending upon the quality of the cement and the methods of mixing it with the other constituents. See CEMENT and STONE. See Gillmore's *Limes, Hydraulic Cements, and Mortars*; Newman's *Notes on Concrete and Works in Concrete*; and Baker's *Treatise on Masonry Construction*.

Q. A. GILLMORE. Revised by MANSFIELD MERRIMAN.

Concretion [from Lat. *concre'tio*, deriv. of *concres'cere*, grow together]: in medicine, an extraneous solid which accumulates within the body. Concretions may be chemical precipitates from the secretions, and as such occur in the bladder, the gall-cyst, or salivary ducts. These are called calculi, and are sometimes of organic and sometimes of non-organic matter. Again, concretions may be of phosphate or carbonate of lime, occurring in tubercular or other degenerate masses; while in the joints they are sometimes of urate of soda, as in "gouty concretions." Within the alimentary canal they are often composed of hair which has been swallowed, or of cholesterin, and sometimes of magnesia salts.

Concu'binage [Fr. deriv. of *concubin*, concubine, from Lat. *concubi'na*; *con*, together + *cuba're*, lie in bed]: the relation of a man and woman who habitually cohabit without lawful marriage; or, more frequently, a kind of inferior marriage, which does not give the woman the legal position of a wife. Concubinage was lawful among the ancient Hebrews, as the cases of Abraham, Jacob, and many other examples show. Concubinage in ancient Rome was often a union between persons who could not legally intermarry on account of difference in rank. It appears that in general the children of a concubine were illegitimate among the Romans, though many examples of their apparent legitimacy have been adduced. The Church of Rome never formally forbade concubinage until the Council of Trent. The Protestant Churches have uniformly opposed it, as contrary to the spirit of Christianity. The only relic of legalized concubinage in enlightened countries is MORGANATIC MARRIAGE (*q. v.*).

Concurrent: literally, moving in conjunction; hence, in law, having the same authority; contributing to the same effect. A *concurrent consideration* occurs where the considerations are mutual promises. A *concurrent jurisdiction* (the most important use of the term) is jurisdiction which may be exercised by any one of two or more courts in the same cause. In such a case the court which first claims and exercises jurisdiction in the cause acquires the exclusive right of determining it. In the U. S. the Federal courts and the courts of the several States often have concurrent jurisdiction, and in such cases where suit is first brought in the State court an appeal lies to the U. S. courts on questions of law arising under the Constitution, laws, or treaties of the U. S.

F. STURGES ALLEN.

Concussion [from Lat. *concus'sio*, deriv. of *concu'tere*, *concus'sus*, clash together; *con*, together + *qua'tere*, clash, strike]: in *medicine*, a disturbance produced by blows or falls, attended with violent shaking as of the brain or other parts of the body. The word is used particularly in regard to the disturbance of the brain in this way. *Concussion of the brain* generally results from a fall or blow in which the head is directly struck, or in which much violent shaking of the brain occurs in consequence of falling upon the feet, buttocks, etc. The first effect is shock, the patient becoming pale and collapsed, the pulse small and feeble, and consciousness only partially preserved. When the shock has spent itself, and the symptoms of concussion proper are present, the patient lies senseless, his pupils dilated, his breathing feeble, and the skin cold and livid or pale. Involuntary discharges of the bowels and bladder may take place, and the patient may gradually sink and die, or he may become more conscious, and at the same time irritable, crying constantly, and perhaps delirious and talkative. This condition may persist for a short time and subside, or it may pass into one of cerebral inflammation with eventual dissolution. The treatment of concussion consists, first, in the treatment of the primary shock, for which external heat, mustard plasters, and other stimulating measures may be required. For the concussion itself, the patient is to be placed at rest in a cool room, and cold applied to the head. No food or merely light liquid diet should be given; the bowels should be kept open by mild laxatives, and the urine drawn with a catheter. Opium and other sedative remedies may be required.

W. P.

Concussion Fuse: See Fuse.

Condamine, kōn'daă'meen', Charles Marie, de la: See La Condamine.

Condé, kōn'day', or **Condé-sur-l'Escaut**: town of France; department of Nord; situated at the confluence of the Haine and the Scheldt; 7 miles N. N. E. of Valenciennes (see map of France, ref. 2–G). It is well built, and has strong fortifications constructed by Vauban. It has a town-hall, an arsenal, and a military hospital; also manufactures of chicory, starch, cordage, and leather. It has been several times besieged, and was taken by the Austrians in 1793. The Princes of Condé derived their title from this town. Pop. (1896) 4,481.

Condé, Henri I. de Bourbon, Prince de: b. Dec. 9, 1552; was a son of Louis I. (see below). He was a cousin of Henry of Navarre, and joined the Protestant army about 1584. He died Mar. 5, 1588, and it is supposed he was poisoned by his servant. He left a son, Henry II., Prince de Condé (d. in 1646), who was educated a Roman Catholic, and was the father of the Great Condé.

Condé, Louis Henri Joseph, Prince de (styled also *Duke of Bourbon*): the last of the line of Condé; b. Apr. 13, 1756. He was the father of the Duc d'Enghien, who was murdered in 1804. Condé fought against the French Republic (1792–1800), and was found dead in 1830, having died by violence, perhaps by his own hand.

Condé, Louis I. de Bourbon, Prince de: French general; founder of the house of Condé, a branch line of the house of Bourbon; b. at Vendôme, May 7, 1530; a son of Charles de Bourbon, Duc de Vendôme; brother of Antony of Bourbon, and uncle of Henry IV. As an adversary of the family of Guise he took a prominent part in the conspiracy of Amboise in 1559. He was the general-in-chief of the Huguenots in the civil war which began in 1562. He was defeated and taken prisoner at Dreux in that year. In 1567 he commanded at the battle of St.-Denis. Having been defeated and wounded at the battle of Jarnac, Mar. 15, 1569, he was shot after he had surrendered. See Desormeaux, *Histoire de la Maison de Condé*; *Mémoires de Louis de Bourbon, Prince de Condé.*

Condé, Louis II. de Bourbon, Prince de (styled *The Great Condé*): celebrated French general; b. in Paris, Sept. 8, 1621; was a son of Henri II., Prince of Condé. In his youth he was called the Duc d'Enghien. He married, in 1641, Clarie Clémence de Maillé-Brézé, a niece of Cardinal Richelieu. In May, 1643, he gained a signal victory over the Spaniards at Rocroi. He defeated the Bavarian general Mercy at Nordlingen in 1645, and inherited his father's title in 1646. He gained a decisive victory over the Spaniards at Lens in 1648. In the civil war of the Fronde, which began in 1649, he at first supported Mazarin and the Royalist party. Early in 1650 he was arrested by Mazarin, whom he offended by his haughty conduct. After he had been confined nearly a year he was released, and raised an army to fight against the court. He marched in 1652 against Paris, which was defended with success by Turenne. In 1653 he was condemned to death, and entered the service of the King of Spain, who gave him command of an army in Flanders. He was there opposed to Turenne, over whom he could not gain much advantage. The war was ended by a treaty between France and Spain in 1659. The Prince of Condé was then pardoned, and returned to the service of the French king. Having obtained the command of an army in Flanders, he fought an indecisive battle at Seneffe against William, Prince of Orange, in 1674. D. Dec. 11, 1686. "The art of war," says Voltaire, "seemed in him a natural instinct." Bossuet pronounced a funeral oration on him. See Desormeaux, *Histoire de Louis, Prince de Condé* (4 vols., 1768); Lord Mahon, *Life of the Prince of Condé* (1840); Voltaire, *Siècle de Louis XIV.*: biography by Fitzpatrick (2 vols., 1874).

Condé, Louis Joseph de Bourbon, Prince de: the only son of the Duke of Bourbon; b. Aug. 9, 1736. He served with distinction in the Seven Years' war (1755–62), and emigrated as a royalist in 1789. He led the French emigrants who in 1792 fought against the republic in co-operation with the Austrian army. He disbanded his corps of emigrants 1801, returned to France 1814, and died May 13, 1818.

Condensation: the act of rendering a body more dense and compact by bringing its particles into closer proximity and increasing its specific gravity. The term is usually applied to the conversion of a vapor or gas into a liquid either by pressure or by the agency of cold.

Condensed Milk: See Milk.

Condenser (in electricity): a device in which the electrostatic induction between charged bodies is made use of for the accumulation and storage of considerable quantities of electricity.

The inductive action between charged conductors depends upon their distance and the nature of the intervening medium, the so-called dielectric. The capacity of a condenser will increase directly as the surface used, and with the specific inductive capacity (*q. v.*) of the dielectric. The capacity increases also as the distance between the plates or coatings diminishes, according to a law which varies with the form of the condenser.

Where the condenser consists of two parallel plates, the distance between which is negligible as compared with their size, the law for capacity is—

$$Q = \frac{K S}{4 \pi d}.$$

Where Q is the quantity of electricity necessary to bring about a unit difference of potential between the plates, S is the surface of one of them, d is the distance between them, and K is the specific inductive capacity of the medium.

Fig. 1.

The *simplest* form of condenser consists of two parallel metallic disks separated by a layer of air. The *best-known* form is the Leyden jar (see Fig. 1). Condensers of large capacity are made by separating many sheets of tinfoil by means of mica or of paraffined paper. Such condensers are usually constructed so that their capacity will be exactly a micro-farad (see Farad), or some simple multiple of that standard.

E. L. Nichols.

Condensing Steam-engine: See Steam-engine.

Condé-sur-Noireau, kōn'day'sür'nwaă'rō': a town of France; department of Calvados; on the river Noireau; 23 miles S. S. W. of Caen (see map of France, ref. 3–D). It has manufactures of muslin, linen, woolens, cutlery, and leather. Pop. (1896) 6,663.

Condillac, kōn'dĕe'yaăk', Étienne Bonnot, de, Abbé de Mureaux: French philosopher; b. at Grenoble in 1715; brother of the Abbé de Mably. He associated in his youth with J. J. Rousseau and Diderot. In 1746 he published *Essai sur l'origine des connaissances humaines* (2 vols.; translated by Th. Nugent in 1756), and in 1749 *Traité des Systèmes* (2 vols.). His reputation was widely extended by his admirable *Traité des Sensations* (3 vols., 1754). He was chosen a member of the French Academy in 1768. He adopted the theory that our knowledge and ideas are derived from the operations of the senses. D. Aug. 3, 1780. Among his works is *Art de Raisonner*, forming part of a series entitled *Cours d'Etudes.* He argues that man owes the development of his faculties to the use of signs. His complete works appeared in 1798 (23 vols.; new ed. 1824, 16 vols.). See Robert, *Les Théories logiques de Condillac* (1869), and Lewes's *History of Philosophy.*

Condition [from Lat. *condĭ'cĭo*, compact, agreement, terms, circumstances, situation; *con*, together + reduced grade of root of *dī'cere*, tell, declare; cf. *abdĭca're*, *dī'cio*, *jurĭ'dĭcus*, *index*, *in'dĭcis*, etc. The spelling *conditio* occurs in the poorer MSS., and is due to the later confusion of palatalized *c* and *t*]: the particular mode, state, or circumstances of a person or thing. In logic it is that on which something else is contingent; something which must precede a cause, and render its operation possible. An inked pen in the hand of a writer may be the cause of a certain writing, but the condition is the capacity of the paper to absorb ink.

Condition, in law, has several significations. 1. *In the Civil Law.*—The principal case here is a clause in a contract, whereby a party, anticipating that an event may produce some change which he is desirous to guard against, provides what shall be done in case the event happens. For example, if it is provided that if a house that is sold is found to be subject to a certain burden or servitude the sale shall be void, the provision is a condition. Conditions were classified in an artificial manner (for which see Pothier on *Obligations*, Domat, and other text-writers). 2. In common law it means the *status* of a person in respect to his legal rights, capacities, and disabilities. (The subject is more fully considered under the word Status.) 3. In common law it further means a qualification or restriction annexed to an estate arising either upon a conveyance or under a will, whereby the estate is created or enlarged or defeated,

or a like clause affecting the existence of an instrument or the operation of a contract. The leading instance to be considered is a qualification annexed to an estate. It is important at the outset to distinguish between a *condition* and a *covenant*. A condition either enlarges or defeats an estate; a covenant is a mere engagement under seal to do an act. If a condition be broken, the estate either does not exist at all, or, if vested, the grantor may by appropriate means defeat it. In case a covenant is broken the remedy is to sue for damages, or to compel the covenantor to perform it, or to prevent him by injunction from breaking it. The same act may by suitable words have imparted to it both the character of a condition and a covenant, when a grantor will have his choice of remedies. Conditions as to their form are either express or implied; as to their relation to the estate they are either precedent or subsequent. A condition is said to be precedent when it precedes the vesting or enlarging of the estate; it is subsequent when, the estate having vested, its regular effect is to defeat it. The distinction does not depend upon any form of words, but upon the intent of the parties. It will be observed that the regular effect of a condition subsequent is to lead to a forfeiture. As the spirit of the law is opposed to forfeiture, it is governed by technical rules that would not be applied in case of a mere action upon a promise or covenant. Great care must be taken not to confound rules which appertain to the one subject with those which prevail in the other. It is an elementary rule that a condition subsequent does not affect the nature of the estate; it only qualifies it to this extent, that in the happening of the specified event it may be made to terminate before its natural expiration. Thus an estate in fee or for life or for years remains a member of its class, though it may be defeated by the happening of the event which is called a condition. It should also be stated that the happening of the prescribed event does not *of itself* defeat the estate. There must be an affirmative act on the part of the grantor whereby he repossesses himself of his estate. This is technically called a "re-entry." In well-drawn instruments a power of re-entry is expressly reserved. This rule is so rigidly adhered to that if a lease should prescribe that an estate of a tenant should, on the happening of an event, be null and void, a re-entry would still be necessary. This rule leads to an important principle, that the right to take advantage of the forfeiture may be waived expressly or by implication, as where rent upon a lease is accepted with knowledge of the cause of forfeiture. The technical rules of the common law do not apply to testamentary provisions or legacies of personal property, as that branch of jurisprudence was developed by the ecclesiastical courts from the Roman law. Much caution is accordingly necessary in discriminating between devises of land and legacies of personal property, for, though in the same instrument, they will be governed by different rules. The rule that the grantor must re-enter is to be confined to a strict case of *condition*. It does not apply to a *conditional limitation*. The distinction between the two should be pointed out. In a condition the estate on the happening of the prescribed event is to return to the grantor; in a conditional limitation it is to pass over to a third person. An illustration will show the difference between them. Thus if a testator should give his daughter an estate to be defeated in case she entered a convent, there would be a condition: but if he had added that in the event supposed it should go to his brother, it would be a conditional limitation. The main importance of the distinction is that in case of the conditional limitation no re-entry is necessary, and the estate on the happening of the event passes at once to the person designated. The law of conditions will be found in the works on real property, such as Washburn, Crnise, and Hilliard, and to a certain extent in works on landlord and tenant, such as Taylor.

T. W. Dwight.

Conditional Limitation: See Condition (in law).

Conditioned, Philosophy of the: a name given to the system of Sir William Hamilton. It is a development and application of the general principle of the Antinomies of Kant, although claimed by Hamilton as an original discovery (*Metaphysics*, 647). It regards the judgment of causality as derived from an impotence of the mind—the principle of the conditioned—the law that the conceivable has always two opposite extremes, and that the extremes are equally inconceivable. We conceive of existence as conditioned in time, and thus expressing at once and in relation the three categories of thought which afford us in combination the principle of causality, the law of which is that when an object is presented phenomenally as commencing, we can not but suppose that the complement of existence which it now contains has previously been. See Hamilton's *Metaphysics*, lect. xxxviii., xxxix. See refutation of the supposed law in *Jour. Spec. Philos.*, vol. iv. (p. 283).

Revised by W. T. Harris.

Condom, kōn′dōn′: a town of France; department of Gers; on the Bayse, here crossed by two bridges; 24 miles N. N. W. of Auch (see map of France, ref. 8–E). It has a church, formerly a cathedral, and manufactures of cotton, mixed fabrics, and porcelain. It was founded in 721 A. D. Pop. (1896) 7,045.

Condonation (in Lat. *condonatio*): in the law of divorce, the conditional forgiveness (express or implied) of an offense for which, without such forgiveness, a divorce may be obtained. Condonation will be implied from cohabitation of the parties with knowledge that the offense has been committed, and with the means of establishing its commission in a court of justice, but in other cases it is sometimes difficult to decide whether the offense was condoned or not. Condonation is conditional in this sense, that a repetition of the offense revives the original charge. According to some authorities the original charge may be revived by the commission of an offense of an inferior grade.

Revised by F. Sturges Allen.

Condor [Span. form of the native Peruvian name *cuntur*]: the great vulture of the Andes, *Sarcorhamphus gryphus* (family *Cathartidæ*). The adult male is glossy black, with a conspicuous ashy white mark upon the wing; a ruff of soft white down encircles the neck, which, as well as the head, is bare and wattled. It is somewhat under 4 feet in length, and its spread of wing is 9 feet. The legs are powerful, but the feet are not fitted for seizing and tearing. The female is duller colored than the male and lacks the wattles. The condor is a resident of the Andes from Ecuador to the Strait of Magellan, and breeds upon precipices, laying two dull-white eggs on the bare rock. Its favorite food is carrion, but it is said to attack and kill young or sickly animals. Its powers of flight are wonderful, and it has been seen soaring above the summits of the Andes at a height of 5 miles above the sea. It is captured with the lasso when gorged with food, and also, we are told, by enticing it to descend upon carrion placed in a small pen, from which it is unable to rise, as the bird takes wing with some difficulty.

Condor.

The California vulture (*Pseudogryphus californianus*) is also sometimes called condor. It is of a brownish black, with a whitish line, formed by the tips of the greater coverts, running across the closed wing, and a broad band of white extends along the under side of the wing, forming a conspicuous mark when the bird is sailing overhead. It is rather more lightly built than its southern relative, but has a little the greater expanse of wing, sometimes measuring 10 feet from tip to tip. In habits the two birds are similar. It is remarkably restricted in its range, which extends only from the Colorado river to the Columbia river and from the Sierra Nevada to the sea.

F. A. Lucas.

Condorcanqui, José Gabriel: See Tupac Amaru II.

Condorcet, kōn′dōr′sā′, Marie Jean Antoine Nicolas Caritat, Marquis de: French philosopher and mathematician; b. at Ribemont, in Picardy, Sept. 17, 1743, of an ancient family of Dauphiné. He studied in the College of Navarre, and became, in 1762, a resident of Paris. Having written an *Essay on the Integral Calculus*, he was admitted

into the Academy of Sciences in 1769. He was an intimate friend of D'Alembert. In 1777 he was chosen perpetual secretary of the Academy of Sciences, and in 1782 was admitted into the French Academy. He had a large share in the *Encyclopédie*. He favored the popular cause in 1789, wrote several able political treatises, and published the influential *Feuille villageoise*, and was elected to the National Convention in 1792. He was a moderate republican, and voted generally with the Girondists. He married, in 1786, Sophie, sister of Gen. Grouchy, noted for her beauty (b. in 1764; d. in 1822). Having been proscribed by the Jacobins in May, 1793, he remained secreted in the house of a friend in Paris for eight months. During this period he wrote *Esquisse d'un Tableau historique des Progrès de l'Esprit humain* (1795). This is regarded as his greatest work. He believed in human perfectibility, and had noble ideas of human destiny. He quitted his place of refuge early in 1794 in order to enjoy a rural excursion, was arrested, and confined in prison at Bourg-la-Reine, where he took poison and died Mar. 28, 1794. "Thus died," says Lamartine, "this Seneca of the modern school. The day of recognition has not come for him, but it will come and will exculpate his memory from reproach." A collection of his numerous works was published by O'Connor and Arago (12 vols., 1847–49). See D. F. Arago, *Biographie de Condorcet* (1849).

Condottieri, kon-dot-tyā'rē̆ē [Ital. plur. of *condottiere*, deriv. of *condotto*, conduct]: Italian mercenaries who, during the Italian wars in the fourteenth and fifteenth centuries, took service under any prince or government that chose to engage them. They consisted principally of heavy-armed cavalry, and for a long period the wars of Italy were left entirely to them. There came to be an understanding between them to spare their troops as much as possible, until at length battles were fought with little more hazard than would be incurred in a tourney. Among the most celebrated were Lodrisio, about 1339; Fra Moreale, 1350; Guarmeri, Lando, and Francesco di Carmagnola, about 1412; Francesco Sforza, about 1450; and the English Hawkwood.

Conduction: See HEAT and ELECTRICITY.

Conductor: a substance through which electricity can pass freely, or on which, if insulated, a charge of electricity can be maintained. Different substances conduct electricity with greater or less readiness. Conductivity varies also according to circumstances, and even substances usually nonconductors sometimes transmit electricity.

Cone [from Lat. *co'nus* = Gr. *κῶνος*, cone, pine-cone]: in geometry, a solid, the curved portion of whose bounding surface is generated by the motion of a line, called the *generatrix*, constantly passing through a fixed point called the *vertex* of the cone, and intersecting a fixed curve along which it moves, called the *directrix*, the moving line extending indefinitely on both sides of the vertex. Two surfaces are generated, meeting in a point at the vertex. These are called *nappes* of the cone; that containing the directrix is called the *lower*, the other the *upper* nappe. In the higher geometry the surface thus generated is called the cone, and the directrix may be any curve whatever, open or closed. In elementary geometry the directrix is restricted to a plane closed curve, and the generatrix extends only from the vertex to the directrix. The cone is *circular*, *elliptic*, etc., according to the form of the directrix. If the latter has a center the line joining the center and the vertex is called the *axis*. If the axis is perpendicular to the plane of the directrix the cone is called *right*; otherwise *obtique*.

Conecte, kō'nekt', THOMAS: martyr; b. at Rennes, France, toward the close of the fourteenth century; burned at the stake in Rome in 1434. He was a Carmelite monk, and produced a deep impression by his preaching denouncing the vices of society at large, and more especially the corruption of the Church. From France he passed into Italy, where his success was still more pronounced. But, as he also preached against the secular power of the pope and the hierarchy, he was accused of heresy, seized, and burnt.

Conegliano, kō-nāl-yaa'nō: a town of Italy; province of Treviso, on a railway from Venice to Trieste; 30 miles N. of the former city (see map of Italy, ref. 3–E). It has a cathedral and silk and woolen manufactures, a triumphal arch erected in honor of Francis I., Emperor of Austria, and a number of fine frescoes by Pordenone, who was born here. Pop. 8,938.

Coney Island: an island situated on the west end of Long Island (annexed to Brooklyn, N. Y., in 1894); 5 miles long from E. to W., and averaging less than a mile in width. It is separated from the mainland by a narrow creek, which runs from Gravesend Bay to Sheepshead Bay. Some 60 acres are arable, but the land is mainly composed of white sand liable to be displaced by the winter storms. It is the most popular watering-place in the vicinity of New York. Until 1874 it was a comparatively neglected waste, only the west end being used to any extent for bathing and recreative purposes. Its rise and growth have been phenomenal, for in four years a few rude restaurants and bathing-houses on a desolate beach were replaced by splendid hotels, concert-halls, bathing-houses, and all the minor amusements suited to great and varied congregations of people. Its great attraction is its fine beach, 5 miles long, fronting the Atlantic Ocean. The water deepens gradually, there is but little undertow, and the surf is rarely boisterous. It is considered the safest beach, extensively used for bathing purposes, upon the coast. Henry Hudson discovered this island on Sept. 3 or 4, 1609. A crew from his ship landed on the shore and trafficked with the Canarsie Indians. Subsequently there was a quarrel, and John Coleman, a sailor, was killed by the savages, and two of the seamen were severely wounded. Coleman was buried at what is now known as Norton's Point. Coney Island therefore has an historical interest as the scene of the first landing of Europeans in the State of New York and as holding the grave of the first white man. To accommodate the travel to this place there are many steam railways and steamboat lines running from Manhattan, Jersey City, Newark, and many points in Brooklyn. The larger part of the amusement-seeking population of the metropolis find their way to Coney Island during the summer season. This great pleasure resort has practically four divisions—Manhattan Beach, Brighton Beach, West Brighton, and the West End. These points are connected by railways and carriage lines. Manhattan Beach is at the extreme eastern end of the island. Coney Island is 10 miles distant from Manhattan. Pop. of Coney Island village (1880) 1,184; (1890) 3,313.

Confederate States, or **Southern Confederacy**: The earlier authentic assertions of a right (alleged to have been reserved by the States in ratifying the Federal Constitution) to resist the constituted authorities and subvert the laws of the Union when one or more of those States should adjudge any exercise of Federal authority unwarranted by the said Constitution were made by the Legislature of Kentucky in 1798, and by that of Virginia in 1799; the Kentucky resolves in which this doctrine was formulated having been prepared by Thomas Jefferson, as those of Virginia were by James Madison. In neither case did these resolves appear to contemplate disunion, but rather a *nullification* of the obnoxious Federal act by the sovereign power of a State. The first distinct avowal of disunion sentiment was made on the floor of the House of Representatives by Josiah Quincy (of Boston, Mass.), who, in opposing the purchase of Louisiana, asserted that this measure (which he agreed with its author, President Jefferson, in pronouncing unconstitutional) virtually dissolved the Union, so that the States were freed from its obligations and should prepare for peaceable or forcible separation. This avowal elicited little sympathy or approval. Again, during the war with Great Britain in 1814–15 some of the more ardent Federalists of New England, being intensely hostile to that war, openly advocated secession, and a convention held by them at Hartford, Conn., was popularly and not unreasonably regarded as impelled by a spirit inimical to the Union. Hence the members of this convention were ever after under the ban of public opinion, and the Federal party never regained the public confidence. Again, when the North and South came into fierce collision respecting slavery on the question of admitting Missouri as a slave State, menaces of disunion if she were excluded were heard—this time from the South. When in 1828 Congress passed a stringently protective tariff, South Carolina, under the lead of John C. Calhoun, George McDuffie, and Gen. James Hamilton, Jr., threatened to nullify the operation of that act within her own borders; and, though that tariff was modified in 1832, she adhered to her resolve and proceeded to call a convention whereby the existing tariff was pronounced null and void. Gen. Jackson, then President, denied her right to do this with effect in a vigorous and masterly proclamation, whereof Edward Livingston, Secretary of State, was understood to be the scribe, and, in some degree, the author. Congress proceeded to modify still further the tariff, and South Carolina there-

upon waived the execution of her ordinance; so a collision was averted.

African slavery, which, though the slaves were few at the North, had been all but universal, became at length distinctively Southern, and was reprobated by an intelligent, conscientious, growing minority at the North. They agitated for the overthrow of human bondage, regardless of the fact that the Federal Constitution conferred on Congress or the non-slaveholding States no power over the domestic institutions of the South. Prophecies and threats of disunion were now freely uttered in the slave States. The question of organizing new Territories from the public domain constantly inflamed this controversy; the South insisting that her people had a right to migrate to any Territory, and there hold their slaves as in their own States; the North denying this, and demanding the conservation of the national domain to free labor. Another compromise in 1850 essayed to end this dispute, but with poor success, the collisions between free and slave labor which followed the organization (in 1854) of Kansas as a Territory widening and deepening the agitation. An attempt to array the South under the banner of State rights against the compromise of 1850 had broken down, even South Carolina refusing to sustain it; but when, in 1860, Abraham Lincoln had been chosen President, on a platform of resistance to slavery extension, by all the electoral votes of the free States except three of the seven cast from New Jersey, the long-meditated struggle for disunion was inaugurated by South Carolina, whose Legislature was then holding a called session. A convention was summoned, which promptly met, and by ordinance (Dec. 20) declared the State no longer in the Union—Georgia, Alabama, Mississippi, Florida, Louisiana, and Texas following her example, making seven States in all which had declared themselves out of the Union before Mr. Lincoln was inaugurated (Mar. 4, 1861). Some of these were barely carried for secession, and in none but South Carolina was the step taken with an approach to unanimity. The other eight slave States, though urged to unite in secession, refused to do so, mainly by overwhelming majorities. In pursuance of an invitation from South Carolina, the seceded States, forming an aggregate population of 2,656,948 free persons and 2,312,046 slaves, sent delegates to a convention which met at Montgomery, Ala., Feb. 4, 1861, and promptly formed a confederacy under a constitution modeled on that of the Union, except that it expressly asserted the right to take slaves into any State or Territory of said Confederacy, and there hold them as property. Of this Confederacy, Jefferson Davis, of Mississippi, was made President, and Alexander H. Stephens, of Georgia, Vice-President—at first *pro tem.*, but they were in due time chosen without opposition for a regular term of six years. Montgomery was continued as the capital of the Confederacy, and its first Congress there assembled.

Hostilities against the Union were inaugurated by Confederates while Mr. Buchanan (who offered no resistance) was still President. Gen. David E. Twiggs had willingly surrendered (Feb. 18) to them at Indianola, Tex., the largest Federal force anywhere embodied; the detachments guarding the Mexican and Indian frontiers were likewise captured, and their arms and munitions treated as spoils of war; the Federal sub-treasury at New Orleans, containing $500,000, had been turned over to the new government, as had several national fortresses and vessels; so that when Mr. Lincoln assumed the duties of President the war had been fairly inaugurated on the side of the Confederacy, but not on that of the Union. Still, he forbore to initiate hostilities—unless the sending of food to the hungry garrisons of the Southern forts still held for the Union could be deemed such—until fire was opened (Apr. 12) by express repeated orders from the Confederate War Department upon Fort Sumter in Charleston harbor, South Carolina, on an islet which had been all but created by Federal effort and expenditure. Batteries had been erected without opposition so near it that this fort was reduced within thirty-six hours; its garrison of seventy men, under Maj. Robert Anderson, being allowed to march out, salute their flag, and be transported northward, not prisoners of war.

A tremendous excitement was produced throughout the country by tidings of this almost bloodless cannonade. At the South it was regarded as at once a general call to arms and an omen of easy, speedy triumph. At the North, where the hope of a peaceable solution had till this time been obstinately cherished, it was received with momentary amazement, followed by intense indignation. "It is an impeachment of our manhood—a challenge to fight!" was the general exclamation. Partisanship, hitherto rampant, of the South, as wronged and outraged by Northern abolitionism, was overawed and silenced; the national flag was everywhere displayed; President Lincoln called for three months 75,000 militia to "repossess the forts, places, and property which had been seized from the Union." But part of the regiments called out were to be furnished by Virginia, North Carolina, Kentucky, Tennessee, Missouri, and Arkansas, whose Democratic governors spurned the call as a usurpation, and by Maryland and Delaware, whose authorities were little better inclined to the suppression of secession by force of arms. Virginia, whose convention, then in session, had previously refused by two to one to secede, now passed an ordinance of secession, and North Carolina soon followed the example, as Tennessee and Arkansas did somewhat later, Gov. Claiborne F. Jackson tried to lead Missouri the same road, but the convention called at his beck utterly refused, so that he was obliged to raise Confederate troops and inaugurate civil war by virtue solely of his executive authority. He was speedily arrested by the prompt, decisive action of Capt. Nathaniel Lyon and Francis P. Blair, Jr., who raised a force which captured his "Camp Jackson," near St. Louis, and most of the men he had assembled; and he was soon forced to flee the State, which, though its people were pretty evenly divided, adhered to the Union, as did Kentucky under kindred auspices. These last two were for years ostensibly represented in the Confederate Congress, but not by their own choice. When the Confederacy was full grown it embraced the States of Virginia, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Florida, Tennessee, Arkansas, Louisiana, and Texas—eleven in all—covering nearly half of the inhabited area of the Union, with rather less than a third of its people. Considering, however, that Kentucky, Missouri, and Maryland contributed largely, persistently, to the Confederate armies, it is fair to estimate the practical Confederate strength at one-half that of the States which remained loyal to the Union.

The Confederate Congress, two days after Mr. Lincoln's inauguration, had authorized the raising of a military force of 100,000 men, to be under the chief command of President Davis. The States which had seized forts, arms, vessels, money, and other public property of the Union, were requested to turn them over to the Confederacy, and generally did so. Commissioners were sent from Montgomery to Washington to negotiate for a peaceful adjustment of all questions arising between the Union and its new-born competitor. They were courteously received by Hon. William H. Seward, Mr. Lincoln's Secretary of State, but no reconciliation of the antagonist pretensions was practicable, and they left, asserting that they had not been frankly, candidly met. The Confederacy had organized its revenue system, and commenced collecting duties on imports from the loyal States and elsewhere, before striking the blow at Sumter, which was deemed necessary to draw Virginia and other hesitating States out of the Union. Two days after President Lincoln's call for militia, President Davis, by proclamation, accepted that as a declaration of war, and authorized (May 17) the issue of letters of marque and reprisal against the commerce of the U. S. A loan of $5,000,000 was advertised at Montgomery, to which $8,000,000 were subscribed. Before the close of April the Confederacy had 35,000 men in arms, of whom 10,000 were being pushed rapidly northward, and the Confederate Congress, which organized at Montgomery on Apr. 20, adjourned on May 21 to meet at Richmond, Va., (the newly chosen capital), on July 20. Treasury notes had already been authorized, and a heavy loan, based on a pledge of cotton by the planters to the Confederacy. All debts due from inhabitants of the Confederate to those of the loyal States were impounded, and directed to be paid into the Confederate treasury. This act was obeyed to the extent of not paying the loyal creditors, but the Confederate treasury was but slightly replenished from this source. At length, when war had begun in earnest, all male citizens of the U. S. over fourteen years old were required by law and proclamation (Aug. 14) either to swear allegiance to the Confederacy or leave its borders within forty days. The Confederate marshals were directed to apprehend and imprison all who disobeyed this edict. A Confederate privateer having been captured and her crew imprisoned in New York as criminals, President Davis, by proclamation (July 6), declared that he would retaliate upon Union prisoners of war any infliction upon those Confederates, and proceeded to make good his word. President

Lincoln recoiled before this menace, and thenceforth treated privateersmen as prisoners of war. Regular exchanges of prisoners between the belligerents were initiated in the winter of 1861–62, and thenceforth accorded without objection. The Confederate authorities, however, did not scruple to treat belligerent Unionists resident within their borders, especially those of East Tennessee, as traitors. Jefferson Davis as President and Alexander H. Stephens as Vice-President were unanimously elected (Nov. 6) for a term of six years ensuing, their previous election having hitherto been provisional only.

The civil war, formally initiated by the bombardment and reduction of Fort Sumter, was prosecuted thenceforth during 1861 with varying fortunes, but with a preponderance of success for the Confederacy. Its first signal triumph was the easy capture (Apr. 20) of the Norfolk navy-yard, with three or four national vessels, including the frigate Merrimack (which some months afterward, having been transformed into the ironclad Virginia, wrought fearful havoc among the national vessels in Hampton Roads), with nearly 2,000 cannon, besides small-arms, munitions, etc., of immense value—all abandoned without firing a shot by the naval officers who should have defended and saved them. The Sixth Regiment of Massachusetts militia, hastening to the relief of menaced Washington city, had just before been assailed (Apr. 19) in the streets of Baltimore by a mob, which showered hardware, paving-stones, and other missiles upon it from housetops as it peacefully traversed their city, killing three and wounding fifteen of the Massachusetts men, while eleven of the mob were killed, and four severely wounded. The militia passed on, but Baltimore was held by the mob, and communication by telegraph or otherwise between the Federal capital and the North arrested until Gen. B. F. Butler reoccupied it, unresisted, by an advance from Annapolis (May 5–13). That important city was henceforth firmly held for the Union. Gen. Butler, being in command at Fortress Monroe, ordered an advance under Brig.-Gen. Pierce against a Confederate outpost at Big Bethel, Va., but the ill-directed attack was repulsed by Gen. J. B. Magruder with considerable loss to the Unionists. That portion of Virginia westward of the Alleghany range having opposed secession, and still adhering to the Union, a Confederate army was sent across the mountains to overbear this (alleged) disloyalty to the State, but was promptly met by a greater Union force under Gen. George B. McClellan, and driven from Philippi (June 2), then beaten at Rich Mountain, and also at Laurel Hill, and again at Carrick's Ford (July 12), and the remnant driven in disorderly flight over the dividing ridge. Hostilities were renewed on the Kanawha by the advance (Aug. 1) of a fresh Confederate force under Gen. John B. Floyd, afterward succeeded by Gen. Robert E. Lee, but these were met and baffled by a stronger Union army under Gen. William S. Rosecrans, and indecisive actions ensued at Carnifax Ferry, on Cheat Mountain, and at Alleghany Summit, which left West Virginia almost wholly under the flag of the Union at the close of 1861. In Eastern (or old) Virginia hostile armies confronted each other near Harper's Ferry and Winchester under Gens. Robert Patterson (Union) and Joseph E. Johnston (Confederate) for a month without fighting, until a stronger Union force, under Gen. Irwin McDowell, was pushed forward by Scott from Washington and Alexandria to Centreville, menacing the Confederate force concentrated around Manassas Junction, and advancing (July 21) to attack its left near Sudley Church. The advance was gallantly made and for a time promised success; but Johnston's army from Winchester arrived by rail at the critical moment and was hurried forward to the support of the recoiling regiments, so that the fortunes of the day suddenly changed, and the Union troops, exhausted by twelve hours' marching and fighting under a July sun, had to give way before this unexpected effort, and retired in a disorder not uncommon on battle-fields, even among veteran troops. The Confederates, unaware of the completeness of their victory, did not pursue it, though their President, Davis, had arrived on the field about the close of the battle. The Union loss in this affair was not less than 4,000 men, mostly wounded and prisoners, with at least twenty cannon and large quantities of small arms; the Confederates lost about 2,000, including two generals (Bee and Bartow) killed. The men who fought were not far from 25,000 on each side, but quite as many more Union soldiers listened to the sound of the guns at Centreville, Fairfax Court-house, in Washington, and on the Potomac, who should have been on the bloody field.

Gen. McClellan was now called from West Virginia, and soon made commander-in-chief, vice Gen. Scott retired; but there was no more serious fighting on this line till Oct. 20, when a Union force of 1,900, pushed across the Potomac opposite Harrison's island, was attacked near Ball's Bluff by Gen. Evans's brigade, mainly Mississippians, and nearly destroyed: its commander, Gen. E. D. Baker, of Oregon, being killed, with 300 of his men, and more than 500 taken prisoners. Two months after, Gen. E. O. C. Ord, with the Third Pennsylvania brigade, having advanced, also on Gen. McClellan's right, to Dranesville, was there attacked by a rebel brigade under Gen. J. E. B. Stuart, who was quickly repulsed with a loss of 230 men. This closed the campaign on the Potomac. Meantime Gen. Butler, sailing from Fortress Monroe (Aug. 20), had captured Forts Hatteras and Clark at the entrance to Pamlico Sound, taking 700 prisoners under Commodore Bowen, 25 guns, 1,000 muskets, and some stores. A more formidable expedition, 10,000 strong, under Gen. T. W. Sherman and Commodore S. V. Dupont, left Hampton Roads Oct. 29, and steered for Port Royal, S. C., where it bombarded and reduced the Confederate forts on Hilton Head and Phillips's island, driving out their defenders and taking undisputed possession of the Sea islands adjacent, which were thenceforth firmly held by a Union land and naval force which menaced both Charleston and Savannah and repeatedly, though unsuccessfully, struck at the railroad connecting them.

In the West, Missouri was this year the arena of a violent though desultory conflict. Maj.-Gen. John C. Fremont, who had been appointed to command here, was hastening westward to organize at St. Louis an army under the depressing influence of the Bull Run disaster in the East, when Gov. C. F. Jackson returned from a two months' sojourn in the Confederacy and prepared to dispute possession of the State, though a convention of her people had declared (July 20) his office and those of his adherents vacated by treason, and all their disloyal acts null and void. He thereupon assumed to take Missouri out of the Union by proclamation (July 31), negotiated a close alliance with the Confederacy, and was raising a large army, in good part from Arkansas, when Gen. Nathaniel Lyon, commanding 6,000 Unionists at Springfield, took the field against Jackson's far more numerous but not so well-provided army, led by Gen. Sterling Price, who suddenly resigned his command to Gen. Ben McCulloch from Arkansas. Lyon, having advanced to Wilson's creek, sent Gen. Sigel with 1,200 men to flank the enemy, whom he assailed in front, but his force was too small; Lyon fell mortally wounded, and the Union attacks in front and flank were repulsed; but the Unionists retired deliberately and unpursued to Springfield, insisting that they had fought quadruple their numbers and not been beaten. Maj. Sturgis, who succeeded Gen. Lyon, soon afterward retreated to Rolla, abandoning all Southern Missouri to the Confederates. McCulloch returned to Arkansas, but Price advanced in large force to the Missouri river at Lexington, where he invested Col. Mulligan and his Irish brigade, numbering 2,780 men, and pressed them so vigorously that Mulligan was forced to surrender (Sept. 20) before Fremont could relieve him. Fremont took the field directly afterward, and pushed down to Springfield at the head of 30,000 men; but Price avoided him by retreating, and there was no fight, except that Col. Zagonyi, with 300 Union cavalry, routed a far larger force which held Springfield, capturing that city. Fremont was still looking for Price when he was relieved (Nov. 2), and ordered to turn over his command to Gen. David Hunter, who, in pursuance of his orders, retreated to Rolla, again abandoning all Southern Missouri to the enemy. Brig.-Gen. U. S. Grant was at this time in command of the important post of Cairo, at the junction of the Ohio with the Mississippi, watched by a Confederate force at Columbus, Ky. Grant, with 2,850 men on four steamboats, dropped down the river to Columbus, landing at Belmont, in Missouri, and attacked the Confederate camp on that side. The attack was spirited, and at first successful; but Maj.-Gen. (Bishop) Polk, commanding at Columbus, crossed with five regiments, increasing the Confederate force to 5,000, by which Grant was beaten off and driven to his boats with a loss of 500 men. The Confederate loss was rather more. One month later Col. Jefferson C. Davis, acting under Gen. John Pope, commanding in Central Missouri, surprised a Confederate camp at Milford, and captured 1,000 prisoners (including three colonels) and as many horses and muskets. Gen. Pope reported 2,500 prisoners taken this month, with a loss on his part of barely 100. So closed the campaign of 1861.

The battles of the bloody year 1862 were initiated at Mill Spring, near the Cumberland river, in Southern Kentucky, where Gen. George B. Crittenden, having just supplanted Gen. F. K. Zollicoffer in chief command of the Confederate force in that quarter, ordered an attack on the Unionists in their front, who, being in superior numbers and led by Gen. George H. Thomas, repulsed them (Jan. 19) after a hot struggle of two hours, and, following them to their camp, found it deserted—Crittenden having fled across the Cumberland, leaving 10 guns, 1,500 horses, etc. Gen. Zollicoffer was killed while leading the attack. This blow was soon followed by one more serious, directed from St. Louis by Gen. Halleck, who sent from Cairo Brig.-Gen. U. S. Grant with 15,000 men, and Commodore A. H. Foote with seven gunboats, to open a way into Tennessee. Fort Henry, 80 miles up the Tennessee river, was quickly reduced (Feb. 6) by the gunboats, the garrison mainly escaping to Fort Donelson, 12 miles eastward, commanding the navigation of the Cumberland, leaving their chief, Gen. Lloyd Tilghman, a prisoner. Gen. Grant followed the fleeing Confederates, and with considerably increased forces nearly invested their stronghold, situated 2 miles below Dover, and held by about 15,000 men under Gen. John B. Floyd, of Virginia. Commodore Foote, ascending the Cumberland, first attacked (Feb. 14) the river-batteries, but was repulsed with considerable loss. Floyd, seeing Grant proceeding leisurely to cut off his retreat, anticipated that result by an advance under Gen. Simon B. Buckner on Grant's right toward Dover, commanded by Gen. John A. McClernand, of Illinois, who was overpowered and driven back after a protracted deadly struggle, losing a six-gun battery. The Union center, under Gen. Lew Wallace, sent two brigades to McClernand's support, by which the Confederate advance was arrested, and Gen. Grant, arriving on the field at 3 P. M. from a conference with Commodore Foote, ordered a general attack, which was crowned with success. Wallace recovered by it the ground previously lost by McClernand, while Gen. C. F. Smith led the Union left clear over the breastworks in their front, and the day closed with a decided Union victory. A cold night of suffering followed, during which Gen. Floyd, despairing of cutting his way out, surrendered his command to Gen. Gideon J. Pillow, who passed it to Gen. Buckner, who, after some parley, surrendered next morning (Feb. 16) not less than 14,000 men, besides 2,000 sick and wounded. Gen. N. B. Forrest, with 800 cavalry, escaped up the bank of the swollen river, while Floyd, Buckner, and a remnant got across by boat before daylight and fled. One result of this success was the immediate evacuation of the Confederate camp at Bowling Green, Ky., as also of Nashville and all Northern Tennessee; Gov. Isham G. Harris and his legislature being among the fugitives. Nashville was promptly occupied by the Unionists, while the main army of Tennessee, under Gen. A. Sidney Johnston, retreated unmolested to Corinth, Miss., leisurely followed by Gen. Don Carlos Buell, who had commanded the Union forces in Kentucky. Gen. Grant's army, now confided to Gen. C. F. Smith, was embarked and moved up the Tennessee to Savannah and Pittsburg Landing, nearly opposite Corinth. These Union successes compelled the evacuation of Paducah and Columbus, while Gen. Pope, with 40,000 Unionists, marching down through Eastern Missouri, drove Maj.-Gen. McCown, with 9,000 Confederates, from New Madrid, taking thirty-three cannon and many thousand muskets, also tents, wagons, etc., without a serious contest. Brig.-Gen. Makall, with 6,700 men, 123 cannon, and 7,000 small-arms, was now caught between Pope's army and Foote's fleet on Island No. 10 in the Mississippi, and compelled to surrender. Commodore Foote, dropping down the river, routed the Confederate flotilla in a brief engagement before Memphis, which thereupon surrendered without a blow. By July 1 the Mississippi river saw none but the Union flag floating above Vicksburg, which successfully resisted successive attempts at its reduction by Commodore Foote from above and Commodore Farragut from below.

Gen. C. F. Smith was soon disabled by sickness and died, and the command of his army again devolved upon Gen. Grant, who, while awaiting the arrival of Gen. Buell from the North, was attacked at Pittsburg Landing by an advance in force of the Confederates from Corinth, 50,000 strong, under Gen. A. S. Johnston, while Gen. Grant was still at Savannah, 8 miles below. The Unionists, about 40,000 strong, were completely surprised without intrenchments or even abatis, and were driven with heavy loss from Shiloh Church, 3 miles inland, to the brink of the river, having lost heavily in guns, killed, wounded, and prisoners. Meantime Gen. A. S. Johnston had been killed, the Union gunboats on the Tennessee had come into play, Gen. Grant had joined his shattered army, while the advance of Gen. Buell's force was beginning to come to its relief. Night brought a cessation of hostilities, and Gen. Beauregard had succeeded to the chief command of the Confederates. On the Union side, Gen. W. H. L. Wallace had been killed at the head of his division. Gen. Nelson's division of Buell's army had crossed the Tennessee in boats at 5 to 6 P. M., and taken position on the field by 7. Two more divisions were on hand by sunrise next morning, when the battle was reopened by an advance of the Union forces, of whom 25,000 (including Gen. Lew Wallace's division of Gen. Grant's army) were fresh, while only 3,000 of the Confederates had not yet been engaged. The fighting throughout the forenoon was spirited, but the forces were unequal, and the Confederates had lost by 4 P. M. all the ground they had gained the day before, and were soon afterward in full retreat. There was but a faint show of pursuit. The reported Union loss in the two days' fighting was 1,735 killed, 7,882 wounded, 3,956 missing; total, 13,573. Beauregard reported the Confederate loss at 1,728 killed, 8,012 wounded, 957 missing; total, 10,699.

Gen. Grant was soon superseded by Gen. Halleck, who, taking command of the combined army, advanced by approaches to Corinth, which was evacuated by Gen. Beauregard, who retreated with little loss into the heart of Mississippi. Meantime Gen. O. M. Mitchel, with part of Buell's army, had advanced eastward up the Tennessee, taking Huntsville and other towns on the river, but failing to carry Chattanooga. Mitchel was now transferred to the command on the coast of South Carolina, where he sickened and died.

The war in the Territories was early initiated by an effort of Cols. Loring and G. B. Crittenden to carry over the 1,200 regulars stationed at New Mexico to the Confederacy; but their intrigues were repulsed on every hand, and they were constrained to flee to El Paso, where Maj. Lynde, who had 700 men, made a pretense of resistance, advancing 20 miles to meet a much smaller Texan force, then retreating, and surrendering his entire command, which was paroled and marched northward for exchange, suffering terribly from heat and thirst. Gen. H. H. Sibley, commanding a Confederate force of 2,300 Texan volunteers, undertook the conquest of New Mexico in the fall of 1861; but his advance was retarded by lack of supplies till the opening of 1862, when he met Col. E. R. S. Canby, commanding a much larger Union force, at Fort Craig. The Unionists were first drawn out of their stronghold, and then defeated by a brilliant charge on McRae's battery, which was taken. Canby's men fled precipitately to the fort, which Sibley could not reduce; so he turned it and pushed on to Apache Pass, where his further advance was opposed by 1,300 men, mainly Colorado volunteers, under Col. John P. Slough, whom he defeated by another Texas charge, which routed Slough's motley crowd and cleared the road to Santa Fé, which Sibley soon entered in triumph. But his brilliant victories proved barren; he could not feed and clothe his little army from all the resources of New Mexico, while Canby was in the way of his receiving supplies from Texas, had any been sent. Forced to evacuate the capital of New Mexico for Albuquerque, whence (Apr. 12, 1863) he moved down the Rio Grande, he encountered Canby at Peralta, but escaped him, after some fruitless long-range fighting, by destroying his train and dragging his guns over a desolate, waterless, mountainous region E. of the river, and thus made his way down to Fort Bliss, Tex., having left half his force dead or prisoners, though never defeated; and returned to report his sage conclusion that New Mexico was not worth a quarter of the cost of taking and holding it.

Some of the largest of the semi-civilized tribes settled in the Indian Territory were incited by their old Democratic agents and other influential whites to link their fortunes with the Confederacy soon after the Union defeats at Bull Run and Wilson's creek. Their aid proved, however, of little worth, and they were glad to return to the protection and alliance of the Union so soon as the progress of events had made it probable that this was the stronger side.

Gen. Sterling Price, after Pope's successes in Missouri near the close of the campaign of 1861, unable to fight a pitched battle, retreated rapidly through Springfield and Cassville, closely pursued, and fighting when he must, till he had reached Arkansas and formed a junction near Bos-

ton Mountain with Gen. Ben McCulloch, commanding a division of Texas and Arkansas volunteers, which raised his force to an equality with that of his pursuers. Gen. Albert Pike now added to the ration-consuming power of the Confederates a brigade of Indians, swelling their total to nearly 20,000 men. Earl van Dorn, late a captain of Union regulars, now a Confederate major-general, assumed chief command, and resolved to fight the Unionists (now led by Gen. Samuel R. Curtis, of Iowa) before they could be concentrated. Advancing rapidly from his camp at Cross Timber Hollows, Van Dorn fell upon Gen. Franz Sigel, holding the extreme Union advance at Bentonville. Sigel retreated (Mar. 3, 1862) fighting, and falling back coolly, until re-enforced at 4 P. M., when he encamped at Leetown on Curtis's right. Curtis held a good position on Sugar creek, which Van Dorn avoided by moving far to the left and attacking in overwhelming force the extreme Union right under Col. Carr, holding a swell of ground known as Pea Ridge. Carr, fearfully overmatched, resisted stubbornly for seven hours, during which he was repeatedly wounded, lost a fourth of his men, and was driven back half a mile. Curtis, who had but scantily re-enforced him up to 2 P. M., now ordered Gens. Asboth and Sigel to the support of Carr, himself accompanying Asboth, whose batteries were soon engaged, and he severely wounded. Night closed the combat as Sigel was coming into position on Asboth's left. Next morning Gen. Curtis, having completed his dispositions, ordered his center to advance, and the cannonade was re-opened on both sides, but the Confederates soon desisted and disappeared, fleeing through Cross Timber Hollows in their rear so rapidly as to defy pursuit. The Union loss in this battle was 1,351 out of 10,500 men. Van Dorn's force was at least 16,000, including 5,000 Indians. Among his killed were Gens. Ben McCulloch and McIntosh: among his wounded Gens. Price and Slack. Lack of ammunition was the reason alleged for his hasty retreat. Gen. Curtis then advanced without resistance to Batesville, Ark., and thence marched to Helena on the Mississippi, but once resisted by 1,500 cavalry under Gen. Albert Rust, who were easily routed with a loss of 100 to 8 Unionists.

Curtis's movement southeastward opened Missouri once more to Confederate incursions. Tidings of Union reverses in Virginia filled the invading ranks with volunteers from all quarters. Col. Porter, commanding some 2,000 of these raw levies, was attacked near Kirksville by Col. John McNeil with 1,000 cavalry and a battery, and after a desperate fight was defeated and his force virtually destroyed. Col. Poindexter, with 1,200 Confederates, was attacked by Col. Odin Guitar while crossing the Chariton river, and his command likewise captured or destroyed. After several more petty conflicts the Confederates were again chased out of Missouri and compelled to take refuge in Arkansas, where Gen. T. C. Hindman was now in chief command. Gen. Blunt commanded the Unionists, who had again entered that State some 5,000 strong; Gen. F. J. Herron, encamped at Wilson's creek with 7,000 men, hastened to his aid when apprised of his danger, reaching Fayetteville, Ark., Dec. 7. Hindman, deceiving Blunt by a threat of fighting, turned his left, and with 10,000 men fell upon Herron's 4,000 infantry and artillery at Prairie Grove, his cavalry having been pushed forward to help Blunt. A spirited fight ensued, Herron, desperately charged, bravely holding his ground until 2 P. M., when the welcome sound of Blunt's batteries was heard opening on his left. The forces engaged were now nearly equal, and the battle raged till after dark, little ground being gained on either side. Next morning the Confederates had left the field. Hindman's loss was 1,317, including Gen. Stein, killed. The Union loss was 1,148, of whom 953 were from Herron's 4,000.

An expedition consisting of thirty-one steamboats and 11,500 men, led by Gen. A. E. Burnside and Commodore L. M. Goldsborough, sailed from Fortress Monroe Jan. 11, 1862, for Roanoke and Albemarle Sounds, N. C., landing (Feb. 5) on Roanoke island a force by which Fort Bartow, its main defense, was speedily taken by assault, with a Union loss of 300, while about 2,500 Confederates were captured. The next point of attack was Newbern, which was likewise carried by assault (Mar. 14). Among the captures were 2 steamboats, 69 cannon, and 500 prisoners. The Union loss in the assault was 600. Fort Macon, on the coast, was next invested and taken, with its garrison of 500 men. This was the first of the regular Union fortresses retaken from the enemy. Washington, Plymouth, and other North Carolina ports fell without resistance, but Gen. Reno was repulsed in a fight at South Mills, and Gen. Foster in an attempt on the important railroad junction at Goldsboro.

Gen. Benjamin F. Butler, having raised in New England six regiments of 1,000 men each for the purpose, and being aided by a fleet under Capt. David G. Farragut, left Fortress Monroe (Feb. 25, 1862) for his rendezvous on Ship island, Miss., whither one of his brigades, under Gen. J. W. Phelps, had preceded him, and where his troops were soon augmented to 15,000. His objective point was New Orleans, a city of 170,000 inhabitants, defended by 3,000 men under Gen. Mansfield Lovell, but the strong forts St. Philip and Jackson, half-way between the city and the mouths of the Mississippi, were Lovell's main reliance. Earnest efforts to strengthen them by a raft or boom across the river were all but thwarted by the high stage of the heavily swelling current. Capt. Farragut, with his fleet of forty-seven armed vessels and 310 guns, appeared before the forts Apr. 17, opened fire next morning, and destroyed or evaded three fire-rafts sent down to annoy him. After three days' ineffective bombardment, the Itasca, Capt. Caldwell, steamed up to the great boom or chain, and cut it with sledge and chisel, when another fire-raft was sent down to no purpose, and two more days were wasted in fruitless cannonading; then Farragut, with his fleet in three divisions, resolved to fight his way by the forts against the sweeping current; which he successfully did, fighting and capturing or scattering the Confederate gunboats above, with a net loss of the Varuna steamship sunk and some 200 men. The forts, thus rendered useless, were soon surrendered. Capt. Farragut, with nine of his vessels, steamed directly up to the city, whence a thick black smoke apprised him that the Confederates were burning ships, steamboats, etc., laden with cotton, sugar, flour, etc. Lovell drew off his men, and the city signified that it could make no resistance. Passing up to Carrollton, 8 miles above, Farragut found its works abandoned and in flames. Gen. Butler, having reduced the forts, soon came up and took possession, which was not thenceforth disputed.

All the towns on the Mississippi below Vicksburg were easily captured by Farragut, and an attempt to retake Baton Rouge (Aug. 5), by a force of 2,500 Confederates under Maj.-Gen. John C. Breckenridge, was repulsed by an equal Union force under Gen. Thomas Williams, who was killed. The Confederates lost 300 men, including Gen. Clarke and six colonels. The Union loss was 250. The lower parishes of Louisiana hereupon fell to the Unionists without serious resistance. Butler was relieved by Gen. N. P. Banks Dec. 16, having just before been outlawed as a felon by Jefferson Davis.

Gen. George B. McClellan had been called from West Virginia to the command of the Army of the Potomac soon after the Union disaster at Bull Run, and on the retirement of Gen. Scott made commander-in-chief of the Union armies. A very large force, fully 200,000 strong, was rapidly gathered around him and drilled into the coherence of a regular army. The far weaker Confederate force confronting him gradually withdrew to Centreville and Manassas Junction, where they spent the winter of 1861–62. Gen. McClellan remained quiet till expressly ordered (Feb. 22) by President Lincoln to advance, when he moved out to Manassas Junction, to find it evacuated by the Confederates, who, under Gen. Joseph E. Johnston, had quietly retired behind the Rapidan. Gen. McClellan now transferred the bulk of his army by water to Fortress Monroe, preparatory to an advance on Richmond up the peninsula between the James and York rivers. Meantime Gen. Banks was left in command in the valley of Virginia, and had just left for Washington, when his 7,000 men, now under Gen. James Shields, well posted near Kernstown, were attacked by Stonewall Jackson with but 4,000 men, who were defeated with a loss of at least 1,000. Gen. Shields's loss was about 600.

Just before McClellan reached the James, the Confederate ironclad Virginia (late the U. S. steam-frigate Merrimack) had sallied out of Norfolk (Mar. 8), and, attended by two gunboats, made directly for the Union frigates Congress and Cumberland, lying near Newport News, and disdaining to reply to their rapid cannonade, of which the balls rebounded from her sloping roof of iron as though they were peas, struck the Cumberland with her iron beak, smashing in the frigate's bow, so that she filled and sank in half an hour, carrying down a part of her crew. The Congress, seeing the fate of her consort, set sail and ran aground under the batteries of Newport News, where she was raked by

the ram until her commander, Lieut. Joseph B. Smith, and most of her officers and men were either killed or wounded, when her flag was hauled down; but her captors were prevented from burning her by a fire from the Union batteries on shore. The Merrimack afterward returned and bombarded her until she was set on fire and blown up, half her crew of 434 men having fallen. The steam-frigate Minnesota and frigate Lawrence, hurrying to the aid of the Cumberland and Congress, had severally grounded in the harbor. The Lawrence soon got off and returned to port, but the Minnesota, still aground, was cannonaded for hours by the entire Confederate flotilla, the Merrimack being unable to approach nearer than a mile, owing to the shallowness of the water. At 7 P. M. all three desisted and steamed toward Norfolk. At ten the new Union ironclad Monitor, Lieut. John L. Worden, steamed into the roadstead on her trial-trip from New York. At 6 A. M. the hostile fleet reappeared and made for the Minnesota, but the little Monitor interposed, and the strange combat was renewed and continued with varying fortunes until the Confederate fleet sheered off and stood for Norfolk. The Merrimack was badly crippled, her commander, Buchanan, having been wounded in the fight with the wooden ships. She never fought again, and was blown up when Norfolk was evacuated by the Confederates not long afterward. The little Monitor (styled a "cheese-box on a raft") remained master of the situation, but was lost, months afterward, in passing Cape Hatteras.

Gen. McClellan reached Fortress Monroe Apr. 2. Of his army 58,000 had preceded him, and as many more soon followed. Advancing up the peninsula, he was soon arrested by Confederate batteries on Warwick creek (which nearly crosses the peninsula abreast of Yorktown), manned by Gen. J. B. Magruder, who had some 11,000 men in all wherewith to hold a line 13 miles long. Thirty days were spent here. When McClellan had planted his breeching-batteries, and was nearly ready to open fire, it was found that Magruder had retreated. On reaching Williamsburg, McClellan's advance was stopped by works known as Fort Magruder, where Hooker's division fought nine hours and lost heavily. At length the Confederate position was flanked by Gen. Hancock of Sumner's division, and Magruder retreated during the night, leaving 700 men severely wounded. The total Union loss was 2,228, that of the Confederates probably less. West Point, at the head of York river, was occupied May 6 with a Union loss of 200. This movement up the peninsula, coupled with Burnside's successes in North Carolina, compelled the Confederates to evacuate Norfolk, with its navy-yard, about 200 guns, and some worthless vessels. That city they never recovered. Gen. McClellan, no longer resisted, advanced to the Chickahominy on the 20th.

Here he halted and fortified with over 100,000 effective men, believing the Confederate army in his front nearly if not quite equal in numbers to his own. Meantime Gen. Fremont, to whom Western Virginia had been assigned as a department, advanced into the Alleghanies and threatened Staunton from the direction of Monterey. Jackson sent Gen. Edward Johnson to oppose Fremont's advance under Milroy, who retreated and was joined by Gen. Robert C. Schenck near McDowell, where a battle was fought, with a Union loss of 461, the Unionists retreating after nightfall. Jackson recrossed Shenandoah Mountain, and marched rapidly down the valley to Front Royal, where he surprised and routed Col. John R. Kenly, taking 700 prisoners. Pushing on to Strasburg, Jackson compelled Banks to retreat rapidly to Winchester, where he fought five hours, and then, being greatly outnumbered, retreated hurriedly to Martinsburg and Williamsport, where he crossed the Potomac, having lost about 1,000 men, besides the sick and wounded in his hospitals. Jackson's cavalry pursued to Martinsburg, but most of his infantry were halted not far beyond Winchester, and soon retreated rapidly to confront Fremont and McDowell, who were hastening to bar his way. Fremont, crossing the Alleghanies by a rugged route, reached Strasburg June 1, a few hours after Jackson had passed that point. Jackson, still retreating, destroyed the numerous bridges behind him, and turned to fight (June 8) at Cross Keys, where he checked Fremont; then, again retreating, he crossed the South Fork at Port Republic, falling with a superior force upon Gen. Tyler, who, with a part of Shields's division of McDowell's army, was forced back with loss. Jackson thus balked all his foes, having lost but 1,167 men since he left Winchester. His baffled pursuers were now recalled, and he, triumphant, was soon ordered to join Gen. Robert E. Lee, now in chief command at Richmond. The rebel general Heth had attacked Col. Crook at Lewisburg, West Va., and been routed on the same day with Jackson's demolition of Kenly.

An unsuccessful attack (May 15) on Drewry's Bluff, 8 miles below Richmond, by a Union fleet under Commander John Rodgers, was followed, May 27, by a fight near Hanover Court-house between the Union Fifth Corps, Gen. Fitz-John Porter, and Gen. L. O'Brien Branch's North Carolina division, which was driven off with a loss of 700, to 400 on the Union side.

Keyes's Fourth Corps having been thrown forward across the Chickahominy to Seven Pines on its right and Fair Oaks on its left, was attacked (May 28) by the Confederates under Gen. Joseph Johnston, who judged that Keyes might be overwhelmed before he could be sufficiently supported. Four divisions, under Longstreet, D. H. Hill, Huger, and G. W. Smith, were designated to make the attack, supported by all the rest of the Confederate army. Hill, at 1 P. M., first attacked Casey's division at Fair Oaks, surprising it while its defenses were still uncompleted, and pushing it back on Couch's division near Fair Oaks, with a loss of six guns, two of its colonels killed, and many men. Keyes barely held his ground at Fair Oaks till Sumner's corps, thrown across the Chickahominy, came to his aid. Heintzelman's corps, though nearer, came into the fight later, and the Union right was now attacked by Smith's corps, directed by Joseph Johnston as commander-in-chief till he was struck by a shell, and so badly wounded that he was disabled for months. Lee succeeded him. McClellan was at New Bridge, several miles up the Chickahominy, with the corps of Fitz-John Porter and Franklin, which were not brought into action. The battle raged without much advantage to either side till dark, when the Confederates drew off. They made a pretense of attacking next morning, to cover their removal of arms and stores from the camp of Keyes's corps, but the fighting amounted to little. Hooker, by Heintzelman's order, made a reconnoissance in force to within 4 miles of Richmond, meeting no resistance, but was recalled to Fair Oaks by McClellan. The Union loss in this affair was 5,739, including five colonels killed and seven generals wounded. Of Keyes's 12,000 men, 4,000 fell or were captured. Gen. McCall's division of McDowell's corps now joined McClellan, raising his total to 156,828, and his effective force to 115,102.

No further offensive movement was made by him until Jackson, whose movements had been studiously concealed, came in on Lee's left, and was pushed forward to assail and turn McClellan's extreme right at Mechanicsville, being supported by Branch, D. H. Hill, Longstreet, and A. P. Hill, with the bulk of the Confederate army.

A. P. Hill, on Jackson's arrival, crossed the Chickahominy and attacked Fitz-John Porter's corps of 27,000 strong, which, recoiling from Mechanicsville, took up a strong position behind it across Beaver Dam creek, but was repulsed (June 26), Jackson having not yet got into position. Porter now retreated by order to Gaines's Mill, where he was at once re-enforced by Slocum's division of Sumner's corps, raising his force to 35,000 men. But opposed to them were 50,000 veterans, led by their ablest commanders, including Longstreet and Jackson. After fighting gallantly for several hours, he telegraphed for aid to McClellan, who sent two brigades of Sumner's corps to his assistance, but the field was lost before their arrival. Porter lost nineteen guns, but halted just off the field, and was not pursued. The Union loss that day was 8,000, that of the Confederates about 5,000. But McClellan's base of supplies, West Point, had been captured by Stuart's cavalry, and he decided to retreat by his left flank through White Oak Swamp to the James. This movement puzzled Lee, who did not pursue with vigor, and the first attacks upon the Union rear were easily repulsed. Finally, McCall's division, serving as rear-guard, was assailed (June 30) in great force at Glendale, and after hard fighting defeated and driven; McCall himself being captured, with most of his guns. The struggle ended at 9 P. M., Hooker's and two brigades of Slocum's division having arrived too late to win the battle, but in time to check pursuit. The loss of men in this action was about 3,000 on either side.

The Union forces were now concentrated at Malvern Hill on James river, where they were attacked by the entire Confederate army, which was signally defeated in one of the most desperate actions of the war. The first attack was made at 3 P. M.; the most desperate charge was made at 6, and repulsed with great slaughter. The Confederate loss

in this struggle must have been nearly or quite 10,000, that of the Unionists perhaps half as many. McClellan during the evening moved down the James to Harrison's Landing, where Lee did not choose to assail him. He claimed 10,000 prisoners, 52 guns, and 35,000 small-arms as captured during the seven days' fighting, from Mechanicsville to Malvern inclusive. The Union loss during those days is reported by McClellan at 1,582 killed, 7,709 wounded, and 5,958 missing; total, 15,249. Jackson's and A. P. Hill's losses during those days were reported by them as 1,585 killed, 7,688 wounded; total, 9,336. This is probably about half the total Confederate loss, which included Gen. Griffith and three colonels, killed. Gen. Hooker soon afterward reoccupied Malvern Hill without resistance, taking 100 prisoners, but the Union army was soon withdrawn by the President's order to the Potomac. Its retreat and embarkation were unmolested. Gen. McClellan and his staff reached Aquia Creek Aug. 23.

Maj.-Gen. John Pope had been called from the West to Washington, and given the chief command of Fremont's, Banks's, and McDowell's forces, aggregating 50,000 men. Maj.-Gen. Halleck was also called from the West to Washington, and made general-in-chief. Pope concentrated his forces near Culpeper Court-house, and sent Banks forward with 8,000 men to Cedar Mountain, where he was confronted by Stonewall Jackson, from Richmond, with 25,000 men. Banks attacked (Aug. 9) under every disadvantage of position, and was steadily repulsed, losing 2,000 men; Jackson's loss was 1,314. Pope arrived at nightfall with Ricketts's division and part of Sigel's (late Fremont's) corps, but Jackson, seeing that Pope was about to move against him in superior force, soon retreated across the Rapidan.

Pope, continuing to act on the offensive, soon found the whole army of Virginia concentrating upon him, and retreated across the Rappahannock. Lee did not choose to force a passage on his front, and sent Jackson around by a long flank march up that river. Encamping at Salem, and emerging through Thoroughfare Gap, he struck the Alexandria R. R. at Bristow Station, in Pope's rear, and captured two trains of cars running westward from Warrenton. He now sent Stuart with two regiments to Manassas Junction, 7 miles farther north, which he surprised, taking 8 guns, 300 prisoners, and 7 trains laden with provisions, etc. Col. Scammon, with two Ohio regiments, now crossed Bull Run and assailed Jackson, but was easily beaten off, and Gen. F. G. W. Taylor, with four New Jersey regiments, renewed the experiment with like result; all of Jackson's and A. P. Hill's divisions being by this time at the Junction.

Pope, by this time aware that something was wrong in his rear, began to fall back on Bristow Station, where Hooker drove Ewell, capturing part of his train. Ewell fell back on Manassas, which Pope's gathering force compelled Jackson to abandon, moving westward, leaving the captured provisions, which he could not remove. Moving toward Thoroughfare Gap, he encountered Rufus King's division of McDowell's corps, which fought him stoutly, but did not bar his way. The loss on either side was heavy, Maj.-Gen. Ewell being among the Confederates wounded.

Pope, now at Centreville, still hoped to envelop and crush Jackson, but was baffled by the non-arrival of Fitz-John Porter at Manassas Junction, and by the emerging of Longstreet's corps through Thoroughfare Gap, driving off Ricketts's division, which attempted to push it back. Before noon (Aug. 29) Longstreet had come in near Gainesville, on the right of Jackson's hotly engaged corps at Groveton, and the battle raged furiously till night, when Pope claimed advantage, and expected to crush the enemy next day. But the re-enforcements he reasonably expected from McClellan's army did not come up; and Pope, unsupported, was beaten and retreated on Centreville, near which Franklin's corps, 8,000 strong, had stood idle all that day (Aug. 30). Here Pope was re-enforced by Sumner, as well as by Franklin; and Lee, now in command, did not choose to attack him in front, but sent Jackson to gain his rear again by a flank march to the northward. Gaining Pope's rear, Jackson attacked his flank rear near Chantilly, where Reno's two divisions and Phil Kearny's confronted him. Gen. Kearny was killed, as was Gen. Isaac I. Stevens, commanding one of Reno's divisions; but Jackson gained no victory. Pope quietly retreated to the Potomac unassailed, and resigned his command, which was given to Gen. McClellan. The Union loss in this brief and bloody campaign was hardly less than 25,000, including 9,000 prisoners; the Confederate loss was hardly less than 15,000. Cols. Fletcher Webster (son of Daniel), of Massachusetts, Roberts, of Michigan, O'Connor, of Wisconsin, Koltes, of Pennsylvania, Cantwell, of Ohio, and Brown, of Indiana, were among the Union killed. Maj.-Gen. R. C. Schenck was wounded.

Gen. Lee, re-enforced from Richmond by D. H. Hill's fresh division, crossed the Potomac, unopposed, opposite Leesburg, and advanced to Frederick, whence he issued (Sept. 8) an address to the people of Maryland, implying that he came as a liberator, but obtained few recruits. Intent on capturing a Union force of 12,000 men holding Harper's Ferry, he divided his army. McClellan followed Lee's right wing, moving west toward Hagerstown, overtaking it at Turner's Gap of South Mountain, and driving it westward, after a fight (Sept. 14) in which he lost 1,568 men and took 1,500 prisoners. Franklin simultaneously cleared Crampton's Gap on the left. Harper's Ferry was surrounded by the Confederates in great force under Stonewall Jackson, and after a brief cannonade was surrendered (Sept. 15) by Gen. D. S. Miles, who was killed by a ball just as he had raised the white flag. Col. Davis had escaped with 2,000 cavalry during the night, but 11,583 men and 73 guns were the trophies of this triumph.

Lee rapidly concentrated his army around Sharpsburg, along a ridge facing Antietam creek. McClellan soon confronted and attacked him (Sept. 17), and a bloody, determined battle was fought there between 87,000 Unionists and 70,000 Confederates, of whom but 40,000 were in position at the outset. McClellan's loss was 2,010 killed, 9,416 wounded, and 1,043 missing; total, 12,469; Lee's, 1,842 killed (including Gens. Branch, of North Carolina, Starke, of Mississippi, and G. B. Anderson, of Georgia), 9,399 wounded, and 2,292 missing; total, 13,533. That was the bloodiest day America has known. Many regiments lost more than half their men. It was in one sense a drawn battle, yet when McClellan, after a day's rest, advanced to renew it, he found that Lee had recrossed the Potomac into Virginia. An irresolute attempt by Gen. Porter to follow was repulsed by Lee's artillery, with a Union loss of 200 prisoners. Lee retreated at leisure by Bunker Hill and Winchester, while Stuart, with 1,500 cavalry, made a raid to Chambersburg, Pa., where he paroled 275 sick and wounded Unionists and destroyed valuable stores, passing around McClellan's army and recrossing the Potomac below Harper's Ferry. McClellan, facing Lee, had moved down to Warrenton, Va., where he was relieved of his command (Nov. 7). Gen. Burnside succeeded him, and, still moving to the left as Lee faced him, at length threw a bridge across the Rappahannock at Fredericksburg, and assailed (Dec. 13) Lee's army, holding the heights south of that river, attempting also to flank his right; but the attack in front, 60,000 strong, led by Hooker and Sumner, was repulsed with great slaughter, while that by 40,000 men under Franklin, in flank, was unsuccessful. The Union loss in this disastrous affair was 1,152 (including Maj.-Gen. G. D. Bayard) killed, 9,101 wounded, and 3,234 missing; total, 13,771. The Confederate loss was about 5,000, including Gen. Maxcy Gregg (just chosen Governor of South Carolina) and Gen. T. R. R. Cobb, of Georgia. Burnside purposed to renew the attack next day, but was dissuaded, and recrossed the Rappahannock unassailed during the night of the 15th–16th. Burnside attempted (Jan. 20, 1863) to cross the Rappahannock by fords above Fredericksburg, but was baffled by a terrible storm, and desisted. Eight days later he was relieved of the command.

Gen. Halleck had taken command of Grant's and Buell's combined forces, now swelled to 100,000 men, directly after the battle of Pittsburg Landing, and by slow and regular approaches had forced Beauregard to retreat with little loss from his fortified position at Corinth. Beauregard was pursued by Pope as far as Baldwin and Guntown, Miss., but to little purpose. Meantime Gen. O. M. Mitchell, with a division of Buell's army, had struck eastward up the Tennessee, occupying Huntsville, Bridgeport, Tuscumbia, etc., and making considerable captures of munitions, railroad cars, etc., with little loss. An attempt on Chattanooga under Gen. Negley was repulsed by Kirby Smith. Subsequent to this the war in that quarter languished under Buell's command, while daring raids were made in all directions by Confederate guerrillas and cavalry under Gens. N. B. Forrest and John Morgan. Clarksville, Tenn., Henderson, and Cynthiana, Ky., were among the towns thus pounced upon, while at Murfreesboro, Tenn., Forrest captured some 1,500 Union troops. The general result of these partisan conflicts was adverse to the Union cause.

Gen. Bragg, having succeeded Beauregard in chief command in this quarter, advanced in June with 45,000 men from the heart of Mississippi into Tennessee, crossing the Tennessee just below Chattanooga, and striking boldly northward through a rugged, mountainous, thinly peopled region. At Richmond, Ky., his advance, under Kirby Smith, fought (Aug. 29) and routed in detail a Union division under Gen. M. D. Manson, of Indiana, who was taken prisoner with nearly 5,000 of his men. Smith boasted that his prisoners equaled in number his entire force. Smith entered Lexington in triumph. Munfordsville, Ky., was captured (Sept. 16) by Bragg, who claimed 4,000 prisoners. Thence Bragg advanced unopposed through Bardstown to Frankfort, where he inaugurated (Oct. 1) Richard Haines as Confederate Governor of Kentucky. Cincinnati, in great alarm, fortified the Kentucky approaches to the Ohio, and Louisville seemed in imminent peril.

Gen. Buell, leaving Nashville strongly garrisoned, had of late been marching northward on Bragg's left with an army finally swelled by raw levies to 100,000, or at least twice the number of Bragg's much better disciplined force. Still, Buell hesitated to attack, distrusting the effectiveness of his men, but at length moved (Oct. 1) from Louisville to Bardstown and Springfield, Bragg retiring and concentrating before him. Moving thence on Harrodsburg, his left was struck (Oct. 9) near Perryville by five divisions of Bragg's army under Gen. L. Polk, which outnumbered and drove the inferior force directly opposed to it, killing Maj.-Gen. James S. Jackson, a Kentucky member of Congress. The fight was maintained from 2 P. M. till dark, with advantage at last on the Union side, but Buell's total loss this day was 4,348, and Bragg's but 2,500. Buell had 58,000 men under his command, but not half of them were engaged, as he did not know his left wing was in action until 4 P. M. Advancing at sunrise the next morning to renew the battle, he learned that Bragg had decamped, and he did not stop till he was behind the Cumberland Mountains in East Tennessee.

Gen. Grant, left in command of West Tennessee, with Rosecrans in Northern Mississippi, the two attempted a combined movement on Gen. Stirling Price at Iuka, Miss. Rosecrans alone attacked (Sept. 19), but Price held his ground firmly, abandoning it during the ensuing night. His loss was at least 1,000; Rosecrans's was 782. Price retreated to Ripley, Miss., where he was succeeded by Van Dorn, who now, with at least 30,000 men, undertook to drive or capture Rosecrans and his 20,000, holding the former Confederate fortifications at Corinth. One of the great charges of the war was made by Price, but failed, because Van Dorn was seven minutes too late on his side. The Confederate loss in this repulse was at least 5,000, including 1,423 killed and 2,248 prisoners. On the Union side 315 were killed, including Gen. P. A. Hackleman, of Indiana, 1,812 wounded, and 232 missing; total, 2,359. Van Dorn and Price retreated precipitately.

Gen. Rosecrans was hereupon given command of the Army of the Ohio (renamed the Army of the Cumberland), in place of Gen. Buell. He had 65,000 effective men, mainly clustered around Bowling Green, Ky., whence he soon transferred his headquarters to Nashville, and prepared to advance. Meantime the brigade of Col. A. B. Moore, of Illinois, at Hartsville, nearly 2,000 strong, was surprised and captured by John Morgan with 1,500 cavalry. Rosecrans, with 46,910 men in three divisions, led by Gens. Thomas, McCook, and Crittenden, left Nashville Dec. 26, advancing slowly, with some desultory fighting, to Stone river, opposite Murfreesboro, where his right under McCook was surprised and crushed by Hardee at 7 P. M., Dec. 31, McCook losing twenty-eight guns and nearly half his men. But when Rosecrans's center was assailed in turn by the triumphant Confederates, his firmness and soldiership, with those of Gen. Thomas, saved the day. Heavy fighting continued throughout the day, with little to boast of on either side since McCook's disaster. But the Confederates had assailed him at all points without success, losing heavily, having been so roughly handled that they did not care to try again. Next day (Jan. 1, 1863) there was a little desultory fighting, mainly at long range. On the day following (Jan. 2) a heavy cannonade was begun by the Confederates, and replied to with spirit; and at 3 P. M. a great charge was made on the Union left by Breckenridge's corps, aided by a heavy enfilading fire from Polk's artillery, but was repulsed after a bloody struggle by the divisions of Negley and Jefferson C. Davis, supporting the fire of Crittenden's batteries, and charging in turn. The Confederates lost four guns and some prisoners, and were pursued across Stone river, where the victors intrenched and rested for the night. The next day passed with little fighting. Bragg at 11 P. M. began to evacuate Murfreesboro, where Rosecrans, on advancing next morning, found only the desperately wounded. Rosecrans reported his losses in this protracted struggle at 1,533 killed, 7,245 wounded, and 2,800 prisoners; total, 11,578 out of 43,400. Bragg reported his loss at over 10,000, including 9,000 killed and wounded, out of 35,000. Cavalry raids by Forrest in West Tennessee, John Morgan in the heart of Kentucky, and Wheeler on the Cumberland, were made this winter to little purpose. Col. A. D. Streight, of Indiana, was sent by Rosecrans (Apr. 10) with 1,800 cavalry to operate on Bragg's rear, but was surrounded near Rome, Ga., by Forrest and Reddy, and compelled to surrender. Sundry minor conflicts in this quarter inflicted in the aggregate about equal losses on either belligerent.

Commodore Foote had triumphantly swept down the Mississippi from Cairo to Vicksburg, co-operating with Gen. Pope on the Missouri and Gen. W. T. Sherman on the Kentucky side. Columbus, Ky., was abandoned on his approach; New Madrid, Mo., and Island No. 10 in the Mississippi, were successively taken by Pope, compelling Gen. Makall to surrender 123 guns and 6,700 men; then Forts Pillow and Randolph, which opened the river to Memphis, where a Confederate fleet of steamboats undertook to bar the way, but was soon demolished (June 4), when Memphis was quietly surrendered. An expedition thence up White river, to open communications with Gen. Curtis, did not find him, but lost the steamboat Mound City, with 150 men, by a ball through her boiler in an attack on St. Charles, which was taken. Commodore Davis steamed down to Vicksburg, and communicated with Farragut below it from New Orleans; but a combined naval attack (July 1) on that stronghold was repulsed, and the siege raised July 24.

Gen. Grant, now at Jackson, Tenn., after the battles at Iuka and Corinth had his department enlarged so as to include Mississippi, while 11,500 men were sent him under McPherson. He had advanced as far as Oxford, Miss., on the way to Vicksburg, when Van Dorn struck (Dec. 20) with cavalry at Holly Springs in his rear, where Grant's stores were awaiting a further reopening of the railroad. The place was occupied by Col. R. C. Murphy, of Wisconsin, who surrendered nearly 2,000 men, nearly half of them in hospital. Grant at once cashiered Murphy in a stinging order, but meantime his stores, worth $4,000,000, had been destroyed or carried off, and he was compelled to turn back into Tennessee.

Gen. W. T. Sherman, with 30,000 men, left Memphis on steamboats, Dec. 21, and fell down the Mississippi to cooperate in the reduction of Vicksburg. Ascending the Yazoo, he made (Dec. 22) a resolute attack on the Confederate batteries commanding Chickasaw Bayou, but the ground was difficult, the banks strong and well manned, and he was repulsed with a loss of 2,000, while Gen. Pemberton reported the Confederate loss at 267.

Gen. John A. McClernand now superseded Gen. Sherman, and at once resolved on the reduction of Fort Hindman (known as Arkansas Post), 50 miles up the Arkansas river. His force was so large, and his dispositions so well made, that his first assault compelled its surrender, with 5,000 prisoners and seventeen guns. The Union loss in the assault was 977. Gen. Grant arrived from Memphis and assumed chief command Feb. 2, 1863.

Attempts to cut a channel across the narrow isthmus opposite Vicksburg on which the Union army was encamped proved failures, and a boat expedition under Gen. L. F. Ross from the Mississippi, through Yazoo Pass, into the Coldwater and Tallahatchie rivers, was stopped and turned back by Confederate works at the head of the Yazoo, returning to the Mississippi unmolested; and one or more kindred attempts to circumvent the defenses of Vicksburg were likewise baffled. At length Gen. Grant decided to gain their rear by the south rather than the north, and, defying high water and other impediments, marched his army 70 miles to Hard Times, nearly opposite Grand Gulf. Commodore Porter, commanding the Union fleet above Vicksburg, ran the batteries of that city with eight gunboats and eight barges, whereof but two were destroyed by their fire, the rest appearing before Grand Gulf in season to bombard its defenses, but to no purpose. Grant thereupon crossed (Apr. 30) at Bruinsburg, some miles below, and, taking them in reverse, easily took possession of Port Gib-

son and Grand Gulf, defeating Gen. Bowen, who had been sent from Vicksburg to resist him, with a loss of nearly 1,000 on each side. Moving up the Big Black, Gen. Grant's advance easily crushed at Raymond two brigades under Gregg; Union loss, 443; Confederate, 723. Advancing to Jackson, the capital of the State, McPherson was there resisted by Gen. W. H. T. Walker, who was promptly defeated, with a Confederate loss of 845 to 265 Union. Here seventeen guns were taken and much material destroyed.

By this time Gen. Joseph Johnston had arrived with reenforcements, and assumed chief command of the Confederates, directing Pemberton to join him with the defenders of Vicksburg. Grant of course moved rapidly westward to bar such junction, and at Champion Hills encountered (May 16) Pemberton, who attempted too late to move northward and join Johnston, but was compelled to fight thrice his force, and was beaten with a loss of Gen. Tilghman among the killed, 2,000 prisoners, and 15 guns. Gen. Loring's division was cut off from Pemberton's, and escaped southward to Jackson. At the crossing of the Big Black, Pemberton fought again, but was soon put to flight, with a loss of 18 guns and 1,500 prisoners. Pemberton, with whatever he still had left, fled into Vicksburg, necessarily abandoning his strong defenses on the Yazoo, with a number of heavy guns. The Confederate navy-yard and hospital at Yazoo City, with 1,500 sick and wounded, were among the fruits of these successes. Grant followed Pemberton closely, and tried to carry his stronghold by assault, but was repulsed with heavy loss. He then sat down to patient sapping and mining, fortifying his rear against Johnston, who was threatening him from Clinton and Jackson, and worked away until Pemberton was starved into a surrender (July 3), having still 15,000 men fit for duty, besides 10,000 in hospitals. Grant reports his total loss from his landing at Bruinsburg to his triumphant entry (July 4) into Vicksburg at 943 killed, 7,095 wounded, and 537 missing; total, 8,515, of whom 4,236 fell before Vicksburg; and claims 37,000 prisoners, of whom a large part were sick or wounded, with arms and munitions for 60,000 men. Among the Confederates killed were Gens. Tracy, Tilghman, and Green. Grant now turned, with a force raised to 50,000, upon Johnston, who had but 24,000, pushed him back to Jackson, and there besieged him, with a loss of 600 on either side, until he decided to decamp, retreating by Brandon to Morton.

During these momentous operations Col. B. H. Grierson, with 1,700 cavalry, raided southward from Lagrange, Tenn., through Pontotoc, by Jackson and Natchez, to the Mississippi at Baton Rouge, taking 500 prisoners and 3,000 small-arms, having traversed 600 miles of mainly horrible roads in sixteen days, losing but twenty-seven men. Milliken's Bend, on the Mississippi, held by Gen. E. A. Dennis with 1,400 men, was attacked by the Confederate general Henry McCulloch with a superior force, which was repelled with a loss of some 500 to either side. Helena, Ark., held by Gen. B. M. Prentiss with 4,000 men, was likewise attacked (June 30) by the Confederate general Holmes with 7,646, losing 1,636, whereof 1,000 were captured. Helena was thereafter let alone.

Gen. Banks, commanding at New Orleans, found Galveston already surrendered (Oct. 8, 1862), without resistance, to a Union fleet of four gunboats, and thence quietly held till he sent down a regiment, of which part was debarked (Dec. 28), when Gen. Magruder, just appointed to command in Texas, organized a fleet of mercantile steamers, shielded by cotton-bales and manned in good part by volunteers, with which he proceeded down the bayou in the night (Dec. 31) and boldly attacked the Union fleet in the harbor, captured the Harriet Lane, sunk the Westfield, and compelled the troops ashore to surrender. And the Confederate privateer Alabama, arriving off the bar soon after, silenced and took the Union gunboat Hatteras, Capt. Blake, which sunk six minutes afterward. Maj. O. M. Watkins, blockading the mouth of the Sabine with two gunboats, was attacked by two Confederate gunboats from up-river, and easily captured.

Gen. Banks had 30,000 men, which sickness, desertion, and detachments soon reduced to 14,000. Having pushed these westward, so as to clear the country of all enemies to the Atchafalaya by an easy fight at Carney's Bridge, he at once returned and laid siege to Port Hudson on the Mississippi, where the Confederates had established batteries to dispute the passage of the river. Commodore Farragut, with four frigates and five gunboats, passed the batteries, losing one of his best vessels in so doing. Banks, deeming the garrison too strong to be successfully assaulted by his force, again moved westward to Alexandria, driving Gen. R. Taylor and taking 2,000 prisoners, several steamboats, and 22 guns. Again Banks returned to the Mississippi at Port Hudson, which he invested, and soon tried to carry by assault, but was beaten off with a loss of 2,000 against 300. He now besieged in due form, and at length made (June 14) a second assault, which likewise failed. But no relieving army appeared, supplies were very short, and the garrison were on short allowance, with little to eat left, when a tremendous salute from the investing Union batteries and gunboats gave notice (July 6) that Vicksburg had fallen. Upon being convinced of this fact, Gen. Gardener surrendered the fort with its garrison of 6,408 men, of whom many were sick or wounded. Banks's effective force was that day about 10,000; his total captures during the campaign, 10,584 men, 73 guns, and 6,000 small-arms.

Brashear City, on the Atchafalaya, was surprised and captured by the Confederate general R. Taylor (June 22), with a Union loss of 1,000 men and 10 guns. The Union camp of Gen. Dudley near Donaldsonville was in like manner surprised (July 12) by 1,200 Texans, and 300 prisoners taken. Banks returned to New Orleans, and sent Gen. Franklin with a fleet and 4,000 men to take the fort at Sabine Pass; but the naval attack was repulsed with a loss of 2 gunboats, 15 guns, and 250 men, which exceeded the whole number opposed to them.

Gen. Banks pushed out a part of his command, under Gen. C. C. Washburne, to Opelousas, to make his own movement on Texas. On his retreat to the Teche, Gen. Washburne's right was attacked (Nov. 1) by Gen. R. Taylor, and roughly handled, the Sixty-seventh Indiana being captured entire. Re-enforcements being brought up, Taylor drew off, having inflicted a loss of 716, and suffered but 425.

Gen. Banks, with 6,000 men, steamed from New Orleans to the Rio Grande, thence capturing Brazos Santiago, Brownsville, Aransas Pass, Fort Esperanza (commanding Matagorda Bay) with little opposition and hardly any loss, there being no considerable force to oppose him. He then returned to New Orleans, leaving Gen. N. J. T. Dana in command, but the latter found no hostile force in that part of Texas, and accomplished very little.

When the spring of 1864 had fairly opened, Gen. A. J. Smith's corps from Sherman's army, supported by Commodore Porter with a powerful steam-fleet, advanced up Red river, menacing Shreveport, while Gen. Steele was to co-operate by a movement from Little Rock, which had been taken by an advance with 12,000 men from Helena six months before. Gen. Price, who was in command there, was far outnumbered and easily routed. He burned six steamboats and some stores, falling back to the vicinity of Red river. Steele lost but 100 killed and wounded in this advance, and took 1,000 prisoners.

Banks's advance, which should have passed Alexandria before Mar. 1, only reached that point on the 16th, and he was not ready to advance farther till about Apr. 1, at which time the river was rapidly falling, and barely navigable for gunboats. By this time his 40,000 men had been reduced by details and sickness to 20,000, whereof the van had reached Sabine Cross-roads, near Mansfield, when, as it moved carelessly through a pine-woods region, it was attacked in great force, outflanked and routed, and an attempt to re-form was baffled by the presence of a supply-train which should have been elsewhere. Retreating, or rather fleeing, 3 miles to Pleasant Grove, the routed van re-formed upon Gen. Emory's division, and was again charged headlong by the flushed Confederates, and brisk fighting ensued, in which the Confederate general Mouton was killed. Every attack was repulsed, and darkness closed the combat. Gen. Banks retreated during the night 15 miles to Pleasant Hill, where Gen. Smith's corps was awaiting him, raising his entire force to 15,000. At 11 A. M. the Confederates appeared, and skirmished continuously till 4 P. M., when they made a grand attack, and were again beaten off, losing 400 prisoners. Gen. M. Parsons (Confederate) and Col. Lewis Benedict (Union) were among the killed. Banks's loss in these fights was 3,969, mainly taken prisoners at the first collision. Though successful in the last struggle, he did not again advance, but marched to the Red river at Grand Grove, thence convoying the fleet, which was often hard aground, back to Alexandria. His rear and his vessels were repeatedly and sharply assailed; in one attack, Gen. Thomas Green, of Texas, was killed. The Eastport, one of the gunboats, being hard aground, was blown up. The rest of the fleet was

saved, and taken down to the Mississippi, passing Alexandria with great difficulty by the help of dams. Having now A. J. Smith's corps to spare, Banks continued his retreat, forced to fight and push aside Gen. Bee with 8,000 men, with a loss of 250 on either side. One steamboat was burned and three captured by Confederates near Dean's Bayou, 30 miles below Alexandria, some 500 Unionists being made prisoners. Part of them were retaken in repulsing (May 6) a Confederate attack on Banks's advance near Mansura, and an attack on his rear (May 19) at Yellow Bayou on the Atchafalaya.

Gen. Steele's advance from Little Rock to co-operate with Banks was, by the retreat of the latter, exposed to great peril. The Confederates under Gen. Fagan turned upon him in great force, drove in or captured his foraging parties, and at length struck his advance a heavy blow (Apr. 25) at Marks's Mill, taking some 1,500 prisoners. Steele thereupon retreated, and was attacked (Apr. 30) by Kirby Smith at Jenkins's Ferry on the Sabine; but the Unionists, though inferior in numbers, had the advantage in position, and repulsed their assailants after a sharp contest, in which the Union loss was 700; the Confederate 2,300, including three generals. Steele's retreat to Little Rock was thenceforth unmolested. Several spirited contests were afterward had in different parts of Arkansas with varying results, but the northeastern half of its area was generally held by the Unionists, the other half by the Confederates nearly to the last.

In 1864, Gen. Rosecrans being now in command in Missouri, Gen. Price entered it from Batesville, Ark., first resisted at Pilot Knob by Gen. Hugh S. Ewing, who held his post throughout a day's fighting, and then retreated. Price advanced to Jefferson City, but, finding it too strong to attack, pushed westward to Lexington, and thence to the Little Blue, sharply followed by Gen. Pleasanton with a superior force, and overtaken at the Big Blue, where he made a stand, but was soon driven westward. Sharply pursued, Price was again overtaken at the Little Osage, where he was again routed with the loss of 8 guns and 1,000 prisoners, including Maj.-Gen. Marmaduke, a brigadier, and five colonels. The residue were chased to Fayetteville, Ark., but without much fighting.

Gen. Hooker, on succeeding, Jan., 1863, to the command of the Army of the Potomac, found it exceedingly demoralized by its disaster at Fredericksburg, the desertions averaging 200 per day. After devoting two months to reorganizing and reinspiring it, during which its force had been gradually raised to 100,000 infantry, 13,000 cavalry, and 10,000 artillery, he judged himself ready to assume the offensive. Dispatching most of his cavalry under Stoneman to destroy railroads, dépôts, etc., in Lee's rear, his van forded the Rappahannock at Kelly's Ford, above Fredericksburg, advancing rapidly to Chancellorsville, where he established his headquarters and paused. Gen. Anderson, who had been watching the fords, being too weak to resist, fell back quietly before him to within 5 miles of Fredericksburg, where Lee met him with two divisions. Meanwhile Stonewall Jackson with two more moved rapidly from Lee's right below Fredericksburg, and passed silently around Hooker's right, several miles W. of Chancellorsville. Suddenly, just before sunset (May 2), Howard's corps, holding the Union right, was struck in flank and rear while ignorant of danger, and in part at supper with arms stacked, by Stonewall Jackson's corps, 25,000 strong, which burst from the thick woods of that region and literally demolished it. Ten minutes after the first shot its men were rushing in wild consternation toward Chancellorsville and the river beyond; thousands of them were unarmed, while very many of them were made prisoners. Two or three regiments were sacrificed in unsuccessful attempts to stay Jackson's impetuous rush. Finally, Gen. Pleasonton got his battery of horse artillery into position, and arrested the advance by murderous discharges of grape at short range. Here fell Stonewall Jackson, mortally wounded: it was said by a volley from some of his own men. It was dark, and they were in the woods; all that is certain is that he died of his wounds eight days afterward. The flight was here stopped, and some of the lost ground regained, but the Eleventh Corps was temporarily extinct; so Hooker drew back his right toward Chancellorsville.

The Confederates next morning followed up their decided success by charge after charge in great force on Gen. Sickles's corps, now holding the Union right, and caused it to give some ground during the day. The carnage of that day was frightful, Sickles having 4,000 out of 18,000 killed or wounded. Hooker had been stunned by a cannon-ball striking a pillar of the Chancellorsville house against which he leaned, and hence failed to support Sickles when support was needed.

Sedgwick, with 22,000 men, had been left in front of Fredericksburg. He crossed the river early that morning just below that city, and was re-enforced by Gibbon, who crossed on a pontoon bridge, raising his troops to 30,000. By noon he had stormed and carried Marye's Heights, taking some guns and prisoners, thence pushing out 4 miles to Salem Church. But this brought him full upon Lee's army, which, having crossed to assail Hooker, now turned upon him, fighting him till darkness interposed. Next morning (May 4) Hooker remained passive, and Sedgwick, finding himself overpowered, retreated across Banks's Ford, having lost nearly 5,000 men. Lee might now have turned in full force upon Hooker, but his men had been overworked, and he hesitated. Hooker recrossed the Rappahannock unassailed during the ensuing night, claiming that he brought back one more gun than he took over, and that he had inflicted greater loss than he suffered, though his own (including Sedgwick's) was no less than 17,197 men. Lee's loss must have been heavy, but was not made public. Stoneman's cavalry returned May 8, having inflicted little loss and suffered little.

Lee soon after recalled Longstreet from a fruitless demonstration against Suffolk, Va., and while Hooker was planning to flank him by crossing the Rappahannock below Fredericksburg, was himself executing a more extensive and daring flank movement by Culpeper Court-house and Sperryville into the Shenandoah valley, and down that across the Potomac. This movement was first fully developed to Hooker by an advance in great force under Gen. Early on Winchester, held by Gen. Milroy, of Indiana, who evacuated it when too late, and lost 29 guns and 4,000 men in his hurried flight across the Potomac. Ewell pursued unresisted to Chambersburg, Pa., which Jenkins, with his cavalry, had reached some days before (June 17). Early's division of Ewell's corps moved forward to York, Pa., while Johnson's division pressed northward to Carlisle, and Imboden's brigade swept the valley of the Potomac westward to Cumberland, Md. By June 25 all of Lee's army had forded the Potomac, and was advancing into Pennsylvania. Ewell's van reached Kingston, but 13 miles from Harrisburg. As counted by two Unionists as it passed through Hagerstown, Lee had 91,000 infantry, 280 guns, and 6,000 cavalry, while 5,000 cavalry under Stuart entered Pennsylvania without traversing Hagerstown.

Gen. Hooker had waited long below and around Washington, incredulous that Lee would invade the free States. At length he too crossed the Potomac with 100,000 men, of whom 15,000 were spared him from the defenses of Washington. He wished to draw 10,000 more from Maryland Heights, opposite Harper's Ferry, but was forbidden to do so by Gen. Halleck. Hooker thereupon asked (by telegraph) to be relieved from the command, and was promptly directed by Halleck to turn it over to Gen. Meade, which he did, and was no more seen in the Army of the Potomac.

A cavalry fight (June 28), inaugurated by Stuart and repelled by Kilpatrick, was the first notice that the two great armies were nearing each other. They casually encountered near Gettysburg, Pa., where Gen. Buford's division of Unionists met the Confederate van under Heth, and drove it back upon its corps (Hill's), by which they were driven in turn. The sound of guns brought up Gen. Wadsworth's division of Reynolds's (First) corps, Reynolds himself going forward to reconnoiter, and being shot dead as he did so. Gen. Doubleday assumed command, but his force, being too weak, was driven back, capturing 800 prisoners as they retreated. Doubleday halted on Seminary Ridge, just W. of the village, where the residue of Reynolds's and all the Eleventh Corps soon came up, Howard assuming command. Ewell's (Confederate) corps next came up from York, and again gave the ascendency to their side, driving the Unionists through Gettysburg, with the loss of their wounded in hospital and several guns. Howard took position on Cemetery Hill, just S. of the village, and dispatched couriers to Meade and Sickles for aid. Sickles was at Emmittsburg, 10 miles away, but hastened to the scene of conflict; Meade, who was at Taneytown, expecting and preparing to fight on Pike Creek, sent Hancock at once to take command at Gettysburg, directing his corps under Gibbon to follow. Slocum arrived at 7 P. M., and took command, Hancock re-

turning to report to Meade. Before morning (July 2) each army had been concentrated around Gettysburg, save that Sedgwick's (Sixth) corps, which was 30 miles distant at 7 P. M., did not arrive until 2 P. M. of that eventful day. One hour later Sickles, who held an advanced position on the Union left, was attacked in overwhelming force by Longstreet just as he was about to recede, and was crushed back with heavy loss, losing a leg by a cannon-shot. Meantime Sykes's (Fifth) corps had seized Round Top, the highest point on that wing, and firmly held it. Hancock rushed to Sickles's relief and Longstreet's advance was arrested, but he held the ground from which Sickles had been driven. Ewell also had assailed and driven the weakened Union right, and the second day's fighting closed with the advantage still on the side of the Confederates.

The third day (July 3) opened with an advance of the Union right under Slocum, who had now been rejoined by a division sent over the day before to support the imperiled left. Slocum retook the ground he had lost, and rested upon it. Then there was a lull of an hour or more.

At 1 P. M. the roar of 115 heavy guns from Hill's and Longstreet's front, crossing their fire over the Union center at Cemetery Hill, announced the crisis of the struggle. For two hours they plowed the Union lines, being less effectively replied to by the less numerous Union artillery. At length the Union guns stopped firing in order to cool their pieces, and now the grand Confederate column of assault emerged from behind their suddenly silent batteries and pressed swiftly toward the Union lines. Pickett's and Heth's (now Pettigrew's) divisions led, charging up to the mouths of the Union guns, but were repulsed with terrible carnage. Pettigrew's brigade, having lost 2,000 out of 2,800 men, retreated under the command of a major. When the remnant regained their own lines the battle of Gettysburg had been lost and won, though a charge was afterward made by Crawford's division of Sykes's corps on the Union left, capturing a battery with 260 men, and retaking 7,000 small-arms, with Sickles's wounded, who had lain for twenty-four summer hours unguarded within the Confederate lines.

Gen. Meade reports his total loss in these three bloody days at 2,834 killed, 13,709 wounded, and 6,643 missing (mainly taken prisoners on the 1st). He claims as trophies 3 guns, 24,978 small-arms, and 13,621 prisoners, including wounded. He estimates the Confederate loss as much greater, which is probable, as about 7,000 of them were buried at Gettysburg, with 4,000 Unionists. Among the Confederate killed or mortally wounded were Gens. Pender, Barksdale, Garnett, Armistead, and Semmes. Had Meade known how badly the Confederates were beaten, he might probably have crushed them; but he doubted and hesitated while Lee retreated to the Potomac, sorely annoyed by the way. Lee says his rear remained near Gettysburg till after daylight of the 5th. He might have been assailed at the Potomac, as his bridge had been burned by Gen. French in his absence, and the river was swollen by heavy rains; yet he rebuilt his bridge, and crossed (July 12–13) his infantry and guns without loss; but a cavalry charge by Gen. Kilpatrick on his rear-guard drove it across with a loss of 125 killed (including Gen. Pettigrew) and 1,500 prisoners. Lee retreated the length of the Shenandoah, and resumed his position behind the Rappahannock, Gen. Meade following and facing him on the north bank.

Gen. Keyes, with 3,000 men, was ordered from Fortress Monroe to capture Richmond during Lee's absence in the North, but though few troops had been left to defend it, he desisted without a serious effort.

A series of partisan affairs ensued on either bank of the Rappahannock, the most important of which was the capture by storm of Rappahannock Station with 1,000 men by the Union brigades under Gen. David A. Russell. The Confederate rifle-pits at Kelly's Ford were in like manner taken, with 400 prisoners.

Meade, aware that Longstreet had been detached for service in Georgia and Tennessee, now advanced to attack Lee's depleted army at Mine Run, but, finally concluding that its position was too strong, desisted and retreated across the Rapidan, and thus closed the campaign of the Army of the Potomac in 1863.

Gen. Morgan made a fresh raid clear through Kentucky, striking and crossing the Ohio (July 7) at Brandenburg, 40 miles below Louisville, with a mounted force said to number 4,000. He then made his way through Indiana and Southern Ohio to Buffing island, not far below Parkersburg, but found the river patrolled by armed steamboats, while a considerable land force was pressing in his rear. Ultimately, less than 400 of his men escaped; all the rest were made prisoners with little fighting. Morgan himself was taken prisoner and confined in the State prison at Columbus, O., whence he escaped and regained the Confederate lines, but was surprised and shot in East Tennessee not long afterward.

Gen. Burnside had been sent from the East to the Ohio, taking his (Ninth) corps with him. Having dispatched a cavalry force under Col. H. S. Saunders across the Cumberland Mountains to burn railroad bridges and destroy stores, in which it was quite successful, with little loss, he crossed those mountains with 20,000 men, and suddenly appeared (Sept. 3) at Knoxville, where he was hailed by the long-suffering Unionists as a deliverer. He next moved on Cumberland Gap, where he captured Gen. Frazier with 14 guns and 2,000 men. But his activity was here arrested by the reverse encountered by Rosecrans at Chickamauga.

Rosecrans had stood idle at Murfreesboro since Jan. 1, 1863, awaiting re-enforcements and supplies, till June 24, when he advanced, taking 3 guns and 500 prisoners at Shelbyville, and soon cleared all Middle Tennessee of armed Confederates; Bragg retreated before him with little loss. Crossing the Tennessee at several points, Rosecrans compelled him to evacuate Chattanooga without fighting, retreating down the railroad that led into Georgia. Rosecrans, misled by his easy success, was pursuing in hot haste, when Bragg, having been re-enforced by Longstreet's corps from Virginia, turned suddenly on his widely scattered divisions, compelling him to concentrate hastily behind the Chickamauga creek. He had 55,000 men; Bragg had scarcely more, and the first day's fighting (Sept. 19) was indecisive. Next morning Rosecrans's right, while attempting to close down on his center, was struck heavily by Longstreet and torn to fragments, the *débris* flying in impotent dismay to Chattanooga, and sweeping Rosecrans along with it. But Gen. Thomas, farther to the left, stood firm, gaining ground somewhat, but maintaining a bold front, and, resting on a wooded ridge, repulsed all attacks until night closed the bloody encounter, when the Confederates drew off, and Thomas stood still through the following day (Sept. 21). At night, still unassailed, he retired to the position assigned him by Rosecrans in front of Chattanooga.

The Union loss in this bloody, protracted struggle was 1,644 killed (including Gen. W. H. Lytle, of Ohio), 9,262 wounded, 4,945 missing; total, 15,581. Bragg's admitted loss was 18,000, but he claims to have taken 8,000 prisoners (including wounded) and 51 guns. But he failed to take Chattanooga, which Rosecrans firmly held, though suffering badly for forage, owing to the barring in of the Tennessee river below him and the raids of Wheeler's Confederate cavalry on the trains coming to supply his rear, until he was directed to turn over his command to Gen. Thomas.

Gen. Longstreet, with his corps, was now detached from Bragg's army, and sent to drive Burnside out of East Tennessee. Longstreet drove the Union forces W. of Knoxville, but here Burnside was found too strong, and an assault made (Nov. 28) on an outpost known as Fort Sanders was repulsed with a loss of 800 Confederates, including two colonels killed. The Union loss was but 100. Longstreet thereupon raised the siege, and returned to the army of Virginia.

Gen. Grant succeeded to the command of Rosecrans's army, while Sherman was ordered from Vicksburg still further to re-enforce it, Gen. Hooker having already been sent in haste with the Eleventh and Twelfth Corps from the Army of the Potomac. Meantime Wheeler had burned a supply-train of 1,000 wagons in the Sequatchie valley, and another at McMinnville, fighting several cavalry commands sent against him, burning many railroad bridges, and escaping into Alabama with but little loss.

Grant found Hooker at Bridgeport, below Chattanooga, and directed him to clear the river, so that supplies could reach the hungry army around Chattanooga. Hooker crossed the Tennessee unmolested, and advanced to Wauhatchie, overlooked by Law's division from Lookout Mountain. At 1 A. M., Oct. 29, Geary, in Hooker's front, was attacked with great impetuosity, but easily beat off his assailants, with a loss of about 400 on each side.

Sherman arrived Nov. 15, soon followed by his army, which was diverted to Grant's left, up the Tennessee. All being at length ready, Grant advanced against Bragg, who was still looking down into Chattanooga from the west of Lookout Mountain. Gen. Grant's Fourth Corps first moved

out (Nov. 22), directly in front of Chattanooga, seizing the Confederate outposts before they could be supported, and taking 200 prisoners; then Hooker's command, during a heavy mist, mounted (Nov. 24) the south and west sides of Lookout Mountain, climbing, fighting, and at length intrenching themselves on the ground they had won. Meantime Sherman crossed the Tennessee in his front, and having firmly intrenched himself assaulted the north end of Mission Ridge, Thomas's cavalry raiding and burning stores in Bragg's rear, while his infantry felt their way up the river till they clasped hands with Sherman's left; and now Hooker crossed the Chattanooga valley from Lookout Mountain to Mission Ridge, pushing the enemy before him and taking 2,000 prisoners. Meanwhile Sherman, stubbornly opposed, was making little progress on the left, until Grant at 2 P. M. gave Hooker orders to advance in the center. His men obeyed with alacrity, charging right up the long, steep ascent, and reaching the crest on six points at once, when the Confederates were seized with panic and fled, abandoning forty guns and losing many prisoners. Darkness alone prevented the destruction of the beaten army, which retreated rapidly to Dalton, Ga., Cleburne in their rear repulsing with ease an attempt to drive his men through a narrow gap in White Oak Ridge, inflicting a loss of 439 to 130. Pursuit was maintained to Ringgold, Ga.

Gen. Grant states his losses at the above battles at 757 killed, 4,529 wounded, and 330 missing; total, 5,616; and claims 6,142 prisoners. The Confederate loss in killed and wounded was undoubtedly the smaller.

Charleston, S. C., and the railroad connecting it with Savannah, Ga., were often menaced, and sometimes struck at, by the Union forces at Port Royal and the adjacent Sea islands, but nothing decisive was effected, save the reduction (April 11, 1862), by Gen. Q. A. Gillmore, of Fort Pulaski, commanding the main entrance to Savannah, until Commodore Dupont, having easily taken possession of the islands and most of the coast-towns of Georgia, steamed down to Jacksonville, which, with Pensacola and other Florida ports, was conceded to him without a struggle. Attempting upon his return to Port Royal to advance upon Charleston off Stono Inlet and river, he was stopped by batteries, and an attack (June 16) by Gen. H. G. Wright with 6,000 Unionists on Secessionville was repulsed with a loss of 574 men. Several kindred but feebler attempts to reach Charleston were baffled, as was one by Commodore Dupont to reduce Fort McAllister on the Ogeechee. The Confederates made in the dark a sally of rams and gunboats (Jan. 31, 1863) out of Charleston, disabling two of the blockading gunboats and alarming the residue, but taking refuge behind Fort Sumter when daylight appeared. The blockade was not interrupted.

Dupont, with nine ironclads, next (April 6) bombarded that port at close quarters, but found his way to Charleston impeded by all manner of piles, chains, etc., and was compelled to retire with little loss on either side. The Atlanta, a Confederate gunboat, steaming down from Savannah, was met by the Weehawken, Capt. John Rodgers, as she emerged from Wilmington river, and torn to pieces in fifteen minutes. She surrendered four large guns and 165 men.

Gen. Quincy A. Gillmore having succeeded Gen. Hunter in command, and being considerably re-enforced, commenced operations by seizing the north end of Morris island, S. of Charleston, and thence besieging Fort Wagner, near its north end, which was regularly assaulted after bombardment July 18, but the storming-party was quickly repulsed with a loss of 1,500, including Gen. Strong and Cols. Shaw and Chatfield, killed. The Confederate loss was but 100.

Gillmore, undismayed, next established a battery of great guns on a platform in a marsh W. of Morris Island, whence he could shell Charleston, 5 miles distant. Eleven batteries rained shot and shell on Forts Wagner and Sumter, and the batteries on Cummings Point. Pushing steadily his approaches to Wagner, he had ordered Gen. Terry to assault (Sept. 7), when he found that the Confederates had evacuated both fort and island, leaving eighteen guns in Wagner and seven in Battery Gregg. Next night Rear-Admiral Dahlgren, now commanding the besieging fleet, sent a large force in row-boats to scale the walls of Fort Sumter, but it was repulsed with a loss of three boats and 200 men.

Gen. Gillmore early in 1864 dispatched Gen. Truman Seymour with a fleet and 6,000 troops to Florida, where he easily took possession of Jacksonville and Baldwin, capturing valuable stores, but advancing rashly westward to Olustee, he was there suddenly attacked by Gen. Finnegan, and beaten with a loss of 2,000 to 730 Confederates. Seymour retreated to Jacksonville, burning $1,000,000 worth of stores.

In North Carolina the Confederate general M. Hoke besieged and captured (Apr. 20, 1863) Plymouth, held by Gen. Wessels with 2,000 men. Among the spoils were 25 guns, 7,000 small-arms, and 1,600 men. Hoke's loss was but 300.

Gen. Grant, having been made (Mar. 1, 1864) lieutenant-general of the Union armies, repaired to Washington and assumed the more immediate direction of the Army of the Potomac, which had been largely re-enforced. Gen. Kilpatrick had just led his cavalry on a raid to within 6 miles of Richmond, whence, after some indecisive fighting, he made his way unharmed to Fortress Monroe. But Col. Ulric Dahlgren, with 400 of his men, having advanced by a separate route on Kilpatrick's right, reached Richmond a day later, and striking thence by a more northerly route was stopped and killed by a regiment of militia at Dabney's Ferry on the Mattapony, his men dispersed, and most of them captured.

Gen. Grant, with Meade's army, crossed the Rapidan unresisted (May 4–5) at Germania and Ely's Fords, striking due S. into the Wilderness. Lee, though looking for him at a higher crossing, at once turned to the right, and attacked in full force. The ground, thickly covered for the most part with small trees, and thoroughly familiar to the Confederates, while strange to the Unionists, was especially favorable to the army which must match its superior knowledge and determination against superior numbers. Two days of desperate fighting, with great slaughter and little advantage to either side, were closed at dark on the 6th with a dashing attack on the Union right by Gen. Gordon, who took 4,000 prisoners, including Gen. Truman Seymour.

Next morning, Gen. Lee awaiting an attack behind his intrenchments, Gen. Grant put his army in motion southward, and was unmolested save by Stuart's cavalry during his march to Spottsylvania Court-house. He had lost in the Wilderness no less than 20,000 men, including Gen. James S. Wadsworth, of New York, killed, and seven generals wounded. Gen. Sedgwick, of Connecticut, was killed two days afterward. The Confederate loss was 8,000, including Gens. Samuel Jones, wounded, Stafford, killed, and A. G. Jenkins, wounded, and Longstreet was disabled for months.

There was heavy fighting around Spottsylvania Court-house for two or three days. On the 11th, at daybreak, Hancock's corps carried by assault a part of the Confederate works, capturing Gens. Edward Johnson and George H. Stewart, with 3,000 men. Gen. Lee narrowly escaped. Hancock captured thirty guns, but after holding them for hours only brought off twenty of them. But he was unable to advance, and days of desperate fighting, which cost the Unionists at least 20,000 men at this point, proved Lee's position impregnable. Acting on the defensive and behind strong works, his loss was much less than Grant's, but it included Gens. Daniels, Perrin, and J. M. Jones, killed.

Grant again moved southward, transferring his right to his left, while his cavalry under Sheridan made a fresh raid toward Richmond, fighting (May 11) and killing Gen. J. E. B. Stuart a few miles N. of that city. Crossing the Chickahominy at Meadow Bridge, Sheridan returned with little loss to Grant's army.

Gen. Butler, with 30,000 men, embarking all but his cavalry, moved up the James and occupied City Point, below Richmond. He was to have seized Petersburg, but missed it. Gen. Beauregard being hastily summoned from Charleston to aid D. H. Hill in defending it. Butler even failed to cut the railroad between that city and Richmond, and was rather worsted by Beauregard in a fight near Proctor's creek, which cost the Unionists 4,000 and the Confederates 3,000 men. Butler was further assailed on several succeeding days, but held his ground with little loss.

Gen. Grant, moving by poorer and more circuitous roads than the direct one held by Lee, on approaching the North Anna (May 17) found his enemy strongly posted, well intrenched, and ready to receive him. There was more fighting here, generally with results favoring the Unionists, but Lee's position could only be stormed at an immense cost of life, and Grant, again moving by his flank, pressed on to Cold Harbor, where he ordered a general assault on the Confederate lines here, as before, confronting him. Those lines were defended by deep and strong abatis of slashed timber, the limbs so intertwisted with each other as to defy speedy untying. The assault was deployed at sunrise (June 3), and in a few minutes was repulsed with great slaughter.

The Union loss was 1,705 killed, 9,072 wounded and 2,406 missing. Gens. P. A. Porter, L. O. Morris, and F. F. Wood (all of New York) were among the killed, with six colonels.

Gen. Grant, unable to interpose between Lee's army and Richmond, now decided to pass the James below that city, while Sheridan was sent on a fresh raid around Lee's left, to tear up railroads and burn stores in his rear. Disappointed in his expectation of finding Hunter in possession of Gordonsville, he was soon surrounded by enemies, with whom he fought an indecisive battle at Trevilian's, returning to Grant with 370 prisoners, having lost in all 735 men.

Grant appeared S. of Richmond in time to have seized Petersburg, but the precious moment was squandered by uninformed or timid subordinates until Lee's army was in good part behind its defenses. Assault after assault was now made (June 16–18) on those defenses with heavy loss, and no result but the knowledge that they could not be thus carried. Then abortive attempts were made (June 21–24) to turn them by the S., which A. P. Hill resisted and baffled, taking in all at least 5,000 prisoners. Then Wilson, with 8,000 cavalry, raided down the Weldon and Danville R. R., but was fought and beaten at Stony creek and Reams's Station, losing 13 guns and 1,000 prisoners.

Grant now moved the Second Corps from his extreme left to his extreme right, and threw it across the James, as if about to attack Richmond from the E. And now (July 30) a mine which had been skillfully run from the center of the Union lines under one of the forts or bastions of Petersburg, was exploded, blowing 300 Confederates into the air and opening a gap in their lines. Hereupon the cannon thundered all along the Union front; but the column of assault, which should have rushed forward on the instant, did not move for several minutes, and then advanced bravely into the chasm made by the explosion, and there halted. The Confederates of course rallied from every side, and poured volley after volley upon the helpless crowd huddled together in the "crater," inflicting on the Unionists a loss of 4,400 men, mostly prisoners, while the entire Confederate loss was but 1,000.

Again (Aug. 12) Hancock assailed Lee's extreme left below Richmond, but with little advantage, the Union loss in operating on this flank aggregating 5,000, while the Confederate was much less, but included Gens. Chambliss and Gherardie, killed.

Lee having necessarily sent several divisions from his right to his left, Grant ordered Gen. Warren southward to seize and hold the Weldon R. R.; but Warren's divisions were struck in flank by A. P. Hill at the critical moment, and twice rolled up on themselves, with an aggregate loss of 4,455 men, mainly prisoners. The Confederates had lost but 1,200, but Warren had seized the Weldon R. R., and he thenceforth held it.

Hancock was sent to seize this road also at Reams's Station, farther down, which he did, but was in turn attacked and driven off by Hill, with a loss of 5 guns and 2,400 men. Hill lost only half that number.

Again, after a pause, Warren advanced (Oct. 1) by order, with four divisions, to the Squirrel Level road in his front, fighting for two days and losing 2,500 men, but holding his ground, and intrenching it so firmly that it could not be taken from him. To cover this advance, Gen. Butler on the Union side had assaulted Fort Harrison with the Tenth and Eighteenth Corps, taking the fort, with fifteen guns. He next attempted Fort Gilmer, but was repulsed with a loss of 300, including Gen. Dunnovan, killed. Gen. Field attempted next morning to retake Fort Harrison, but was beaten off with heavy loss. A few days later Gen. Kautz, whose Union cavalry had been pushed up the Charles City road to within 5 miles of Richmond, was there surprised and driven, with a loss of 9 guns and 500 men. The Confederate general Gregg, of Texas, was killed in the ensuing fight, which had no result.

Hancock was next ordered farther to the Union left to find and turn the Confederate flank, and in a fight with Hill's corps, which attempted to interpose between his divisions, took 1,000 prisoners. Darkness arrested the fighting, but Hancock drew off in the night, having lost 1,500 men and inflicted equal loss upon the enemy. Thus closed on this point the campaign of 1864, with Warren holding the Weldon R. R., and Butler threatening Richmond, the losses of the Army of the Potomac during the year having aggregated 88,387 men.

When Virginia separated from the Union her western counties, including most of those lying beyond the Alleghanies, strongly protested against the ordinance, voted "No" when it was submitted to the ordeal of popular suffrage, and refused to be bound by it. Calling a convention at Wheeling, they decreed a separation from the old State and the formation of a new one, first named Kanawha, but since known as West Virginia. They had previously organized a loyal State government for Old Virginia, which (hardly an eastern county being represented in it) readily agreed to the organization of the new State. Meantime the Confederates had seized Harper's Ferry and destroyed the Baltimore and Ohio R. R. for some distance W. of it, and they soon sent a force over the Alleghanies to secure obedience to the Confederate authorities at Richmond. It was promptly confronted by Gen. McClellan with a far larger army, organized in Ohio, but largely composed of West Virginians. A part of it routed (June 3, 1861) the enemy at Philippi, another detachment at Rich Mountain (July 12), and the main body under Gen. Garnett, who, in full retreat, was overtaken and routed at Carrick's Ford on the Cheat river, where Garnett was killed and some prisoners were taken. The residue escaped over the Alleghanies.

Gen. J. D. Cox, advancing up the Kanawha, drove the Confederates under Gen. Wise before him, Wise burning (July 28) Gauley bridge to arrest the pursuit.

Gen. John B. Floyd now assumed command of the Confederates, inspirited by their triumph at Bull Run, and had an indecisive conflict (Aug. 10) with Gen. Rosecrans at Carnifex Ferry. Floyd held his ground, but retreated during the ensuing night.

Gen. R. E. Lee now assumed command in this quarter, and there was much marching with little serious fighting till winter closed the campaign, and little of consequence occurred here the next year, when Gen. J. C. Fremont succeeded to the command of the Union forces, but was hurried over the mountains to resist Stonewall Jackson's raid down the valley. Thereupon the Confederate general Heth raided across the mountains and attacked (May 23, 1862) Col. George Crook at Lewisburg, but was beaten off with loss. Thenceforward the operations on either side in this quarter were limited to inconsiderable raids and surprises.

Gen. Franz Sigel was assigned chief command (Union) in the valley in the spring of 1864, when, with 10,000 men, he advanced to New Market, where he was met by Gen. John C. Breckenridge with an equal force, and routed with a loss of 6 guns and 700 men.

Breckenridge was unable to follow up his victory, being obliged to send much of his force over the mountains to oppose Crook, who, with 6,000 men, had beaten McCausland's far inferior but well-posted force near Dublin Station, and had broken the Virginia and Tennessee R. R. at that point. Gen. Averell, with 2,000 cavalry, raiding farther west, had tried to destroy the Confederate salt-works near Wytheville, but had been beaten off by John Morgan. Both Crook and Averell thereupon retreated.

Gen. David Hunter was now assigned to the command of Sigel's beaten army, which was strengthened, while Breckenridge had been called off to re-enforce Lee at Richmond. Hunter advanced to Piedmont, near Staunton, where he was confronted by Gen. W. E. Jones with a hastily collected army, which was beaten (June 8) in a spirited action, wherein Jones was killed and 1,500 of his men captured.

Hunter thereupon occupied Staunton, where he was joined by Crook and Averell, and then, with 20,000 men, pressed on to Lynchburg and fiercely assailed it, but was met and beaten off by a superior Confederate force under Early, hastily dispatched by rail from Lee's army. Outnumbered and short of ammunition, he retreated over the Alleghanies into West Virginia, whence he regained the Potomac by a long and toilsome circuit. Meanwhile the valley was left without any considerable Union force, and Early hurried down it with 20,000 triumphant veterans, Sigel retreating and burning stores till he had crossed the Potomac and took post on Maryland Heights, where Early did not choose to assail him, but crossed into Maryland, scouring the country for cattle, horses, and provisions of all kinds, threatened Pennsylvania, and then turned upon Baltimore. Gen. Lew Wallace could hardly muster 5,000 men to oppose him, but fought him (July 9) at the passage of the Monocacy, near Frederick, and was of course defeated, losing 2,000 men (mainly prisoners), while the victors lost but 600. Early now turned upon Baltimore, and menaced Washington, skirmishing (July 12) with its outpost defenses, but made off rapidly into Virginia with 2,500 captured horses and 5,000 cattle.

Gen. Wright's Sixth Corps had just been sent from Grant's army to the relief of Washington, as had Emory's Nineteenth Corps, just arrived by sea from New Orleans. Wright followed Early to the Shenandoah, where his rear was sharply turned upon and repulsed (July 19), with a loss of 500. Wright retired to Leesburg, and turned over his command to Crook, while Averell had (July 20) a cavalry fight near Winchester, and took 4 guns and 200 prisoners.

Wright's and Emory's corps being now recalled to the James, Crook, supposing Early gone likewise, advanced to Winchester, and was there beaten (July 24), and driven to Martinsburg and across the Potomac, with a loss of 1,200, including Gen. Mulligan, killed.

Early now sent B. T. Johnson with 3,000 cavalry on a raid into Pennsylvania, where they burned without resistance Chambersburg and the barracks at Carlisle. Averell, with an equal cavalry force, soon encountered the raiders, but they escaped with little loss into Virginia. Pursuing to Moorefield, Averell at last struck the raiders (Aug. 4) and worsted them, with a loss of their guns, wagons, and 500 prisoners.

Gen. Grant now sent Sheridan to command in this department, where Hunter's army, just arriving from the West, the Sixth and Nineteenth Corps (whose recall to the James had been countermanded), and Torbert's and Wilson's divisions of cavalry from Grant's, had raised his effective force to 30,000 men.

Sheridan, after taking time to reorganize his army, advanced to Winchester, and found Early strongly posted and fortified on Opequan creek, whence he dislodged him (Sept. 19) after an obstinate fight, in which his loss was fully 3,000 prisoners, including wounded, while among his killed were Gens. Rhodes and Godwin.

Early rallied his beaten army at Fisher's Hill, a very strong position S. of Winchester, where his flanks were guarded by two mountains. Here Sheridan again attacked and routed him (Sept. 22), taking 16 guns and 1,100 prisoners. Pursuing the remnant to Port Republic, he sent his cavalry to Staunton and to Waynesboro, destroying provisions and munitions, then retired down the valley to Winchester, burning all the grain and forage as he passed, so that the enemy should find no subsistence there. This devastation was made an excuse for the attempts to burn New York and other cities by incendiaries soon afterward.

Sheridan had encamped on Cedar creek, and, apprehending no danger, had gone on a visit to Washington, when Early, re-enforced, having stealthily followed down the valley, determined to surprise the unsuspecting army before him. In this he succeeded perfectly, flanking Crook's force on both sides in the dense darkness, and rushing into the camps with a fearful yell just before daylight, and in fifteen minutes Crook's army was a fleeing, panic-stricken mob, having lost 24 guns and 1,200 prisoners. Sheridan was at Winchester on his return when the disastrous tidings met him, and, riding at full speed, reached his beaten army at 10 A. M. He spent two hours in reviving the spirits of his men, and, after repulsing one fresh attack on his left, ordered at 3 P. M. a general advance, which was successfully made, followed by a second charge, which was still more successful—though the Confederates opposed to them nearly all the cannon of both armies—facing the foe to the rear, and driving them through Staunton, recovering the 24 guns lost in the morning, and taking 23 others, with 1,500 prisoners. The total loss of men this day was about 3,000 to each side, including the Confederate general Ramseur and the Union general Bidwell, of New York, killed. This closed the campaign in that quarter.

There were various partisan conflicts in Alabama, Mississippi, and West Tennessee during 1864, but none of consequence save at Fort Pillow, Tenn., which was assailed and taken (Apr. 13) by the Confederate general Forrest, killing Major L. F. Booth, who commanded, with most of his garrison of 557 men, of whom 262 were blacks, many of them after resistance had ceased. This was in accordance with the threats previously made by Confederate officers that colored troops should in no case receive quarter.

Gen. S. D. Sturgis with 12,000 men was sent from Memphis in quest of Forrest, whom he found at Guntown, Miss., where Sturgis was speedily routed and driven back to Memphis with a loss of at least 4,000, mainly prisoners. Forrest's entire force was not much greater than this. Gen. A. J. Smith now assumed command, and pressed Forrest back to Tupelo, Miss., where the Confederates thrice assaulted his lines, and were repulsed with loss, but with no decisive result. Smith retreated, and again advanced to Holly Springs, not seriously opposed, while Forrest raided into Memphis with 3,000 cavalry and took a few prisoners, but failed to capture the Union generals of whom he was in quest or to liberate the captured Confederates.

East Tennessee was this year the scene of several partisan conflicts to little purpose, and John Morgan raided through Pound Gap into Eastern Kentucky, capturing and paroling Gen. Hobson with 1,600 Unionists in a field at Licking River. Gen. Burbridge struck the raider at Mt. Sterling, and again near Cynthiana, capturing or dispersing at least half his force, and chasing the rest into Southwestern Virginia. Attempting here to destroy the salt-works near Abingdon, Burbridge was beaten off (Oct. 3), with loss, by Gen. Breckenridge.

Gen. Sherman, on Grant's transfer to the East, was left in chief command at the West. Advancing with 100,000 men from Chattanooga early in May, 1864, he was confronted by Joseph E. Johnston, who, having but 54,000, declined a pitched battle, but availed himself of the broken country and fortified positions on the rugged road to Atlanta. He was stubbornly resisted (May 10) at Resaca, where the railroad crosses the Oostenaula river, and was at first repulsed with loss, but soon flanked the position and compelled its abandonment. Checking Sherman's advance at Adairsville and Cassville, Johnston made his next determined stand at the Allatoona Pass, and days were expended in fighting and flanking before he could again be driven. He next made a stand at Kenesaw Mountain, flanked by Pine and Lost Mountains, connected by strong field-works, where he for several days resisted every effort to move him. In one assault (June 27) Sherman lost 3,000 men, including Gens. Harker and Dan McCook, killed; Confederate loss, 442. And now, by again advancing his right, Sherman forced Johnston out of his impregnable position, compelling him again to retreat, which brought him to Atlanta. Here he was relieved by Gen. Hood, who condemned his cautious policy, which had only depleted his army by 14,700 men in two months' constant fighting. Re-enforcements had nearly kept its ranks full, its present strength being 51,000. Sherman advancing his left under McPherson to break Hood's railroad connection with the East, Hood struck heavily (July 20) at his right under Thomas, but was repulsed after a bloody struggle, which cost the Confederates at least 4,000 men, including Gens. W. S. Featherston, of Mississippi, Armistead, of Georgia, and George M. Stevens, of Maryland, killed. The Union loss was but 1,500. Supposing that Atlanta had been silently evacuated, the Unionists thereupon rushed up to within 2 miles of the city, but found here strong works well manned, and were repelled with loss. Maj.-Gen. McPherson, of Ohio, was killed, as was Gen. Greathouse, of Illinois, and another bloody struggle resulted, with advantage to the Unionists, though it cost them over 4,000 men. The Confederate loss was nearly double, including Gen. W. H. T. Walker, of Georgia, killed.

A pause in the fighting now ensued, and Gen. Stoneman with 5,000 Union cavalry raided upon the railroads and stores in Hood's rear, but, scattering or dividing his forces too much, he was surrounded and captured with 1,000 men, as Col. Harrison, with 500 more, had just been.

Sherman now moved the Army of the Tennessee, led by Howard, from his extreme left to his extreme right, initiating a new flanking movement, when Hood assailed Logan's (Fifteenth) corps on the new Union right, but was repulsed with heavy loss. Hood now sent Wheeler's cavalry to raid on the Union rear, while Kilpatrick's Union cavalry pressed to the Confederate rear, breaking both the railroads leading southwardly from Atlanta, and returning to camp Aug. 22. Sherman again threw forward his right till most of his army was behind Atlanta, holding firmly the railroad to Macon. Hood had already sent off part of his army to Jonesboro, whence Hardee with two corps attacked (Aug. 31) Howard fiercely, but was beaten off with a loss of 2,000 to Howard's 500. And now Jonesboro was assailed in its turn by Jefferson C. Davis's corps and carried, eight guns, Gen. Govan, and many men being captured. Hood thereupon exploded his munitions and burned his stores in Atlanta and escaped eastward. Slocum took quiet possession of what was left Sept. 1. Sherman returned to the city, and gave his men a well-earned rest.

Wheeler's raid was prosecuted throughout Northern Georgia and East Tennessee, returning through the Sequatchie valley, and being chased across the Tennessee near Florence.

He destroyed much property, but with little influence on the fortunes of the war.

Hood, rejoined by Hardee, now passed Sherman's right, and sent French's division to capture the Union post at Allatoona, which Gen. J. M. Corse held with 1,944 men, but so gallantly that assault after assault by quadruple numbers was repulsed with fearful slaughter. Gen. Cox at length relieved Corse, who was wounded, as were most of the higher officers. He had lost in all 707 men, while French left 231 dead, 411 prisoners, and 800 muskets. Hood, still marching northward, surrounded Resaca, but did not assault it, Sherman being too near. Sherman, at length learning that Hood had advanced into Middle Tennessee, gave up the pursuit, sending the Fourth and Twenty-third Corps to Chattanooga, with orders to report to Thomas at Nashville, while he, facing about, returned to Atlanta and reorganized and equipped his remaining forces for his march to the sea.

Hood, with 35,000 infantry and artillery, struck boldly for Nashville, preceded by Forrest with 10,000 cavalry. Of course there was immense destruction of stores, bridges, and dépôts—$1,500,000 worth of boots and provisions having been burned at Johnsonville, Tenn., to save them from capture.

Thomas concentrated 30,000 men at Pulaski, but was unable to cope with Hood's army, now swelled to 55,000 in all, which still clung to the Tennessee river till assured that Sherman had cut loose from Atlanta, marching southward when he set his columns in motion northward. Gen. Schofield, on his part, retreated from Pulaski to Columbia, and thence to Franklin, in a bend of the Harpeth, where he, with less than 20,000 men but a good position, was assailed (Nov. 30) with desperate resolve. The Confederates were repulsed with a loss of at least 4,500, including Gens. Cleburne, Gist, Adams, Trahl, and Granbury. The Union loss was 2,320, but no guns. Schofield continued his retreat that night. Hood followed, and soon sat down before Nashville.

The movement was audacious, as Thomas was at least his equal as a commander, and could soon concentrate a larger force than that which attempted to besiege him. But Thomas would not strike till he was ready, while severely cold weather impeded operations. At length Thomas struck out (Dec. 15), and, after two days' skillful fighting, drove his besiegers at all points, heading them toward Alabama, and taking 53 guns and 4,462 prisoners, including a major-general. Hood got across the Tennessee at Bainbridge with a few guns and barely the *débris* of an army. Thomas had taken in this brief campaign 72 guns and 11,857 prisoners, besides administering the amnesty oath to 2,207 deserters from the Confederate service. The aggregate Union loss in this campaign was 10,000. And Gen. Stoneman, moving eastward from Knoxville, had cleared East Tennessee of armed Confederates, captured Wytheville and the lead mines and salt-works, driving Breckenridge's depleted force over the mountains into North Carolina.

Gen. Sherman, after dispatching Thomas with two corps to the defense of Tennessee, had still with him four corps, numbering in all 65,500 men. Concentrating these around Rome and Kingston, Ga., he destroyed the railroads about him, cut the telegraph which still connected him with the North, and stood clear of all communications as he commenced his famous march to the sea. There being no considerable army in his front, he advanced rapidly through Atlanta, Macon, Milledgeville, and Millen to Savannah, slightly opposed at several river-crossings, while Kilpatrick with his cavalry covered his flanks and screened his movements, so that Augusta seemed to be his objective point. Fort McAllister on the Ogeechee was assaulted (Dec. 13) by Hazen's division, and communication at once opened with Dahlgren's fleet, when Savannah was evacuated (Dec. 20) by Hardee, after destroying his vessels and stores. Thus far Sherman had on this march lost but 567 men, and had taken 167 guns with 1,328 prisoners. He remained a month in Savannah, while Gens. Dana, Davidson, and Grierson, who had been sent out from Vicksburg and Memphis to distract attention from his march, swept over large portions of Mississippi and Alabama, breaking up railroads, destroying stores, and taking prisoners. These raids were uniformly successful, but Gen. Foster, who had ascended Broad river from the Sea islands to break the railroad connection between Charleston and Savannah near Gordonsville, was beaten off, losing 746 men.

Sherman, leaving Savannah well garrisoned, set his column again in motion (Feb. 1, 1865), traversing the heart of South Carolina with little resistance, except from its flooded swamps, and compelling Hardee to evacuate Charleston and its harbor-defenses, retreating northward with 12,000 men. Columbia, the State capital, though undefended, was undesignedly burned. Kilpatrick, who, with 5,000 cavalry, still covered the advance on the left, was surprised and routed by Wade Hampton near the north line of the State, but soon rallied his men and beat off his assailants. Reaching Fayetteville, N. C., Mar. 11, Sherman found himself confronted by Joe Johnston with 40,000 men, collected by Hardee, Beauregard, Cheatham, and Bragg, and including Wheeler's and Hampton's cavalry. After halting three days, Sherman once more advanced, when his left wing was attacked (Mar. 15) in a narrow pass by Hardee, who was soon driven; but Slocum on the right was next assailed (Mar. 18), when approaching Bentonville, by Johnston with his main body. The Confederates withdrew after a sharp action, in which Sherman lost 1,643 men and took 1,625 prisoners, including wounded, burying 267 Confederate dead. Next day, Sherman advanced to Goldsboro, and halted his troops while he made a hasty visit to Gen. Grant at City Point.

Wilmington, N. C., had long been the principal port through which blockade-runners found access to the Confederacy. Gen. Butler, with Commodore Porter, led an army and fleet to reduce it (Nov. 16, 1864), but returned to Fortress Monroe unsuccessful. Gen. A. H. Terry was next dispatched with a stronger force, which, after a heavy bombardment by Porter's fleet, carried Fort Fisher by assault (Jan. 16, 1865), killing Maj.-Gen. Whiting, its commander, and taking 169 guns and 2,083 prisoners, with a Union loss of 110 killed and 536 wounded; but 300 more were lost by the explosion next day of the fort's chief magazine.

Gen. Schofield was now sent to Terry's aid, ranking him, and raising his force to 20,000, with which Schofield entered Wilmington, Feb. 22, Hoke retreating after a sharp fight, burning two privateers and other vessels, with heavy stores, but leaving sixty-five guns. Schofield now advanced inland, losing 700 men by a surprise, but beating off (Mar. 10) an attack on his left by Hoke, who here lost heavily and retreated, enabling Schofield to communicate and co-operate with Sherman on his arrival at Goldsboro.

Gen. Canby, commanding at New Orleans, moved eastward in the spring to menace Mobile, while Gen. James H. Wilson, with Grant's and Thomas's cavalry, 15,000 strong, pushed southward from Eastport, Miss., the head of steamboat navigation on the Tennessee, confronted only by Forrest with but 5,000, whom Wilson easily defeated near Maplesville and routed (Apr. 2) at Selma, Ala., which he took, with 32 guns and 2,700 prisoners. Crossing the Alabama, Wilson entered Montgomery, which Adams had just left, burning 125,000 bales of Confederate cotton. Turning eastward, Wilson soon appeared at Columbus, Ga., where he took 52 guns and 1,200 prisoners, burning a gunboat, 250 cars, and 115,000 bales of cotton. Taking by assault Fort Tyler on the Chattahoochee, Wilson pushed on to Macon, Ga., where he learned that the war was virtually at an end.

Gen. Canby, with nearly 30,000 men, aided by Porter's powerful fleet, invested Mobile, which was held by Dick Taylor with some 15,000 men. Investing Spanish Fort, he reduced it by bombardment, taking 652 prisoners, and then assaulted Blakely, which was carried by assault, with a Union loss of 1,000 to 500 Confederate killed and wounded, with 3,000 prisoners. Mobile was then evacuated by Gen. Maury, who, with 9,000 men, escaped up the river, abandoning 150 guns.

Gen. Grant, still before Petersburg, had bloodlessly (Dec. 7, 1864) extended his left 20 miles down the Weldon R. R. to Hicksford, which he fortified and held. He next essayed to advance his left to Dabney's Mill, but was resisted and driven back to Hatcher's Run, where the Confederates were in turn repulsed (Feb. 6, 1865), and the ground up to this point held and fortified. The Union loss in this operation was 2,000; the Confederate, 1,000, including Gen. Pegram, killed.

Gen. Sheridan moved up the valley from Winchester with 10,000 mounted men, drove Early (Mar. 2, 1865) from his intrenched camp at Waynesboro, taking 11 guns and 1,600 prisoners, thence rode into Charlottesville, where he destroyed immense stores and miles of the Richmond and Lynchburg R. R., and, passing behind Lee's army, reported to Grant at Petersburg Mar. 27.

Lee, assuming the offensive, sent Gordon with two divi-

sions against the center of the Union line before Petersburg. Charging at daybreak (Mar. 25), Gordon surprised and took Fort Stedman in his front, capturing three batteries and some prisoners, but, not being properly supported, he was attacked and routed in turn by the Ninth Corps, losing 2,000 prisoners; besides which the loss to either side was about 2,500. Grant interpreted this rash assault as premonitory to a Confederate evacuation of Richmond and Petersburg, which he resolved to harass, if not intercept. Again throwing forward his left (Mar. 29) to seize the Boydton plank-road, while Sheridan's cavalry on its flank advanced to Dinwiddie Court-house, he was opposed by Lee with most of his army, who suddenly struck Warren's corps in flank and rear, with intent to repeat the lesson of Chancellorsville. Two divisions were then broken, but Griffin's, behind them, stood firm while the fugitives were rallied, and Warren was thus enabled to repel his assailants with heavy loss; but an attempt to carry their works was defeated in turn. Meantime Sheridan had gained Dinwiddie Court-house, but, attempting to advance thence to the Boydton plank-road, was foiled, but advanced again next morning (Apr. 1) to Five Forks, where he connected with Warren, advancing on his right, and ordered a general charge on the Confederate works in their front, held by two divisions, who were fearfully overpowered and routed, with a loss of 5,000, mainly prisoners. The Union loss was but 1,000, including Gen. Frederick Winthrop, killed. And now, sending two divisions eastward to Gravelly Church, Sheridan again connected with the Union lines before Petersburg, whence a general cannonade preluded the assault, which was delivered at daylight next morning (Apr. 2), Wright's Sixth Corps gaining the rear of these works by the south, and taking many prisoners, while Ord's corps carried Forts Gregg and Alexander by storm, losing 500 men. A. P. Hill, in attempting to retake some of the captured works, was shot dead, and his corps utterly defeated.

Lee now, at 10.30 A. M., telegraphed to Davis that Richmond must be evacuated at once, and it was evacuated between that time and next morning, while its immense warehouses, filled with provisions, munitions, and stores of all kinds, were fired by the departing Confederates, burning out the heart of the city. Flames and explosions notified the Unionists in front that the Confederate capital was abandoned, and Gen. Weitzel at 4 A. M. (Apr. 3) was assured by a Negro from the city that Davis and all his official or military adherents had departed. Picking his way through the abatis, earthworks, rifle-pits, torpedoes, etc., which encircled the burning city, Weitzel at 6 A. M. led his men into the city, soon followed by President Lincoln, who was at City Point. Petersburg was simultaneously abandoned, Lee retreating up the railroad toward Danville, while ringing of bells and immense gatherings all over the North and West hailed the relinquishment of Richmond as the downfall of the Confederacy.

Davis escaped by train to Danville, while Lee halted two days at Amelia Court-house, vainly seeking provisions for his hopeless army, now reduced, mainly by prisoners, to 35,000 men. Grant was soon on his trail. The fleeing host was first seen from Deatonsville, and was struck near Sailor's creek by Custer's horse, supported by Crook's and Davis's divisions. Here 16 guns, 400 wagons, and some prisoners were taken, while Ewell's thinned corps was cut off from Lee's rear, and so enveloped that it was obliged to surrender. Ewell himself was among this day's 6,000 prisoners.

Lee crossed the Appomattox at Farmville, repelling Gen. Theodore Read, who tried to stop his way with two regiments. But Humphrey's Second Corps was again so close on his rear that he was obliged to turn and fight a few miles beyond Farmville, repulsing his assailants with a loss of 600. But this lost a day, which was wasted by attempts to bar the Danville road, while Lee was really making for Lynchburg. Undeceived on this point, pursuit was resumed on the morning of the 8th, Grant having meantime sent Lee a courteous note inviting a surrender. Sheridan pushed his troops 28 miles on the 8th, reaching Appomattox Court-house, heading Lee's army, intercepting its sorely needed supplies from Lynchburg, and planting himself across the road whereon it must move on the morrow, and sending word to Grant, who ordered a forced march of Griffin's and Ord's corps to Appomattox Station during the night. Lee had meantime sent a note to Grant inviting a meeting, with a view to peace, at 10 A. M. In the morning (April 9) Grant replied, saying he had no authority to make peace, but urging a surrender. Lee's weary, famished army set forth as usual this morning, and, seeing cavalry in their front, advanced to push it aside, when it was withdrawn to the flanks, disclosing solid regiments of infantry behind it. Lee, seeing that further fighting would be a useless slaughter of his men, at once called a parley, which resulted in a surrender, "each officer and man to be allowed to return to his home, not to be disturbed by U. S. authority so long as they observe their paroles and the laws in force where they may reside." The number thus paroled at this point was 27,000. Johnston's army in North Carolina surrendered on the same terms to Sherman at Raleigh, Apr. 26, and Dick Taylor's to Canby at Citronelle, Ala., May 4. E. Kirby Smith, commanding the Confederates W. of the Mississippi, attempted to make a stand after the surrender of Lee, but his men all deserted him, and, taking whatever Confederate property they could lay hands on, dispersed to their several homes.

Jefferson Davis halted at Danville, anxiously awaiting advices from Lee, until astounded (Apr. 10) by tidings of his surrender. He then fled southward to Greensboro, N. C., and again halted till it was evident that Johnston would soon capitulate, when he flitted again to Washington, Ga., with a cavalry scout, which at first numbered 2,000, but rapidly wasted. Here he abjured the state of a ruler, and was making his way to the coast with his family and a few faithful followers when he was surprised and captured (May 10) while encamped near Irwinsville by two detachments of cavalry sent out from Macon by Gen. Wilson to look for him. His family was liberated at Savannah, but he was held a close prisoner in Fortress Monroe for two years, then released on bail, and never brought to trial. So ended the Southern Confederacy. HORACE GREELEY.

The above account of the causes and the progress of the civil war was compiled for the most part from the author's *American Conflict*, and is generally so free from errors that it has not been thought necessary to give it any revision whatever. It therefore stands as Mr. Greeley wrote it. For students who would study the subject at length, the following are the most important authorities: Horace Greeley, *The American Conflict* (1864–66); *Personal Memoirs* of U. S. Grant (1885–86); Jefferson Davis, *The Rise and Fall of the Confederate Government* (1881); A. H. Stephens, *A Constitutional View of the Late War between the States* (1868–70); *Memoirs* of Gen. William T. Sherman (1875); *Personal Memoirs* of P. H. Sheridan (1888); the Count of Paris, *History of the Civil War in America* (1876–88); Nicolay and Hay, *Abraham Lincoln* (1890). C. K. ADAMS.

Confederation [from Lat. *confœdera'tio*, league: *con*, together + *fœdus*, treaty, covenant, from I.-E. root *bheidh-* in its form *bhoidh-*; cf. *fido*, *fides*, and Gr. *πείθω*, *πέποιθα*, *πίστις*]: a league, a federal compact, an alliance of princes, states, or nations; nearly synonymous with confederacy. The republic of Mexico is called the *Mexican Confederation*. The numerous states of Germany were united in 1815 by the Congress of Vienna, and formed the Germanic confederation (*der Deutsche Bund* in German). Before the adoption of the Federal Constitution of the U. S. in 1788, the Government of this country was a weak confederation of thirteen independent States, which recognized no superior or central authority.

Confederation, Articles of: a document drawn up by the Congress of the U. S., Nov. 15, 1777, and adopted finally July 9, 1778, but not ratified by the States until Mar. 1, 1781, by which the several States united in a league of perpetual friendship "for the common defense, the security of their liberties, and their mutual and general welfare." These articles, thirteen in number, proved very inadequate to the needs of the situation, because Congress had very limited powers, and the executive had no means of enforcing its authority in opposition to the will of individual States. For these reasons a convention called by Congress met at Philadelphia, May 14, 1787, with Washington as its president, and on Sept. 14 of that year the convention closed its labors and reported the CONSTITUTION OF THE UNITED STATES (*q. v.*). The following were the Articles of Confederation:

ARTICLES OF CONFEDERATION.—*To all to whom these presents shall come, we, the undersigned, delegates of the States affixed to our names, send greeting*: Whereas the delegates of the United States of America in Congress assembled did, on the fifteenth day of November, in the year of our Lord one thousand seven hundred and seventy-seven, and in the

second year of the independence of America, agree in certain articles of confederation and perpetual Union between the States of New Hampshire, Massachusetts Bay, Rhode Island and Providence Plantations, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, and Georgia, in the words following, viz.:

Articles of Confederation and perpetual Union between the States of New Hampshire, Massachusetts Bay, Rhode Island and Providence Plantations, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, and Georgia.

ARTICLE 1. The style of this confederacy shall be "The United States of America."

ART. 2. Each State retains its sovereignty, freedom, and independence, and every power, jurisdiction, and right, which is not by this confederation expressly delegated to the United States in Congress assembled.

ART. 3. The said States hereby severally enter into a firm league of friendship with each other for their common defense, the security of their liberties, and their mutual and general welfare; binding themselves to assist each other against all force offered to or attacks made upon them, or any of them, on account of religion, sovereignty, trade, or any other pretense whatever.

ART. 4. The better to secure and perpetuate mutual friendship and intercourse among the people of the different States in this Union, the free inhabitants of each of these States, paupers, vagabonds, and fugitives from justice excepted, shall be entitled to all privileges and immunities of free citizens in the several States; and the people of each State shall have free ingress and regress to and from any other State, and shall enjoy therein all the privileges of trade and commerce, subject to the same duties, impositions, and restrictions, as the inhabitants thereof respectively: provided that such restrictions shall not extend so far as to prevent the removal of property imported into any State to any other State, of which the owner is an inhabitant; provided also, that no imposition, duties, or restriction shall be laid by any State on the property of the United States or either of them.

If any person guilty of or charged with treason, felony, or other high misdemeanor, in any State, shall flee from justice, and be found in any of the United States, he shall, upon demand of the Governor or Executive power of the State from which he fled, be delivered up and removed to the State having jurisdiction of his offense.

Full faith and credit shall be given in each of these States to the records, acts, and judicial proceedings of the courts and magistrates of every other State.

ART. 5. For the more convenient management of the general interests of the United States, delegates shall be annually appointed in such manner as the Legislature of each State shall direct, to meet in Congress on the first Monday in November in every year, with a power reserved to each State to recall its delegates, or any of them, at any time within the year, and to send others in their stead for the remainder of the year.

No State shall be represented in Congress by less than two, nor by more than seven members; and no person shall be capable of being a delegate for more than three years in any term of six years; nor shall any person, being a delegate, be capable of holding any office under the United States, for which he, or another for his benefit, receives any salary, fees, or emoluments of any kind.

Each State shall maintain its own delegates in a meeting of the States, and while they act as members of the committee of the States.

In determining questions in the United States in Congress assembled, each State shall have one vote.

Freedom of speech and debate in Congress shall not be impeached or questioned in any court or place out of Congress; and the members of Congress shall be protected in their persons from arrests and imprisonments during the time of their going to and from and attendance on Congress, except for treason, felony, or breach of the peace.

ART. 6. No State, without the consent of the United States in Congress assembled, shall send any embassy to, or receive any embassy from, or enter into any conference, agreement, alliance, or treaty, with any king, prince, or state; nor shall any person holding any office of profit or trust under the United States, or any of them, accept of any present, emolument, office, or title of any kind whatever, from any king, prince, or foreign state; nor shall the United States in Congress assembled, or any of them, grant any title of nobility.

No two or more States shall enter into any treaty, confederation, or alliance whatever, between them, without the consent of the United States in Congress assembled, specifying accurately the purposes for which the same is to be entered into, and how long it shall continue.

No State shall lay any imposts or duties which may interfere with any stipulations in treaties entered into by the United States in Congress assembled, with any king, prince, or state, in pursuance of any treaties already proposed by Congress to the courts of France and Spain.

No vessel of war shall be kept up in time of peace by any State, except such number only as shall be deemed necessary by the United States in Congress assembled for the defense of such State or its trade; nor shall any body of forces be kept up by any State in time of peace except such number only as, in the judgment of the United States in Congress assembled, shall be deemed requisite to garrison the forts necessary for the defense of such State; but every State shall always keep up a well-regulated and disciplined militia, sufficiently armed and accoutred, and shall provide and have constantly ready for use, in public stores, a due number of field-pieces and tents, and a proper quantity of arms, ammunition, and camp equipage.

No State shall engage in any war without the consent of the United States in Congress assembled, unless such State be actually invaded by enemies, or shall have received certain advice of a resolution being formed by some nation of Indians to invade such a State, and the danger is so imminent as not to admit of a delay till the United States in Congress assembled can be consulted; nor shall any State grant commissions to any ships or vessels of war, nor letters of marque or reprisal, except it be after a declaration of war by the United States in Congress assembled, and then only against the kingdom or state, and the subjects thereof, against which war has been so declared, and under such regulations as shall be established by the United States in Congress assembled, unless such State be infested by pirates, in which case vessels of war may be fitted out for that occasion, and kept so long as the danger shall continue, or until the United States in Congress assembled shall determine otherwise.

ART. 7. When land forces are raised by any State for the common defense, all officers of or under the rank of colonel shall be appointed by the Legislature of each State respectively, by whom such forces shall be raised, or in such manner as such State shall direct, and all vacancies shall be filled up by the State which first made the appointment.

ART. 8. All charges of war, and all other expenses that shall be incurred for the common defense or general welfare, and allowed by the United States in Congress assembled, shall be defrayed out of a common treasury, which shall be supplied by the several States in proportion to the value of all land within each State granted to or surveyed for any person, as such land and the buildings and improvements thereon shall be estimated according to such mode as the United States in Congress assembled shall from time to time direct and appoint.

The taxes for paying that proportion shall be laid and levied by the authority and direction of the Legislatures of the several States, within the time agreed upon by the United States in Congress assembled.

ART. 9. The United States in Congress assembled shall have the sole and exclusive right and power of determining on peace and war, except in the cases mentioned in the sixth article—of sending and receiving ambassadors—entering into treaties and alliances; provided, that no treaty of commerce shall be made whereby the legislative power of the respective States shall be restrained from imposing such imposts and duties on foreigners as their own people are subjected to, or from prohibiting the exportation or importation of any species of goods or commodities whatsoever—of establishing rules for deciding in all cases what captures on land or water shall be legal, and in what manner prizes taken by land or naval forces in the service of the United States shall be divided or appropriated—of granting letters of marque and reprisal in times of peace—appointing courts for the trial of piracies and felonies committed on the high seas, and establishing courts for receiving and determining finally appeals in all cases of captures; provided, that no member of Congress shall be appointed a judge of any of the said courts.

The United States in Congress assembled shall also be the

last resort on appeal in all disputes and differences now subsisting or that hereafter may arise between two or more States concerning boundary, jurisdiction, or any other cause whatever; which authority shall always be exercised in the manner following: whenever the legislative or executive authority or lawful agent of any State in controversy with another shall present a petition to Congress, stating the matter in question, and praying for a hearing, notice thereof shall be given by order of Congress to the legislative or executive authority of the other State in controversy, and a day assigned for the appearance of the parties, by their lawful agents, who shall then be directed to appoint by joint consent commissioners or judges to constitute a court for hearing and determining the matter in question; but if they can not agree, Congress shall name three persons out of each of the United States, and from the list of such persons each party shall alternately strike out one, the petitioners beginning, until the number shall be reduced to thirteen; and from that number not less than seven nor more than nine names, as Congress shall direct, shall, in the presence of Congress, be drawn out by lot; and the persons whose names shall be so drawn, or any five of them, shall be commissioners or judges, to hear and finally determine the controversy, so always as a major part of the judges, who shall hear the cause, shall agree in the determination; and if either party shall neglect to attend at the day appointed, without showing reasons which Congress shall judge sufficient, or being present shall refuse to strike, the Congress shall proceed to nominate three persons out of each State, and the secretary of Congress shall strike in behalf of such party absent or refusing; and the judgment and sentence of the court, to be appointed in the manner before prescribed, shall be final and conclusive; and if any of the parties shall refuse to submit to the authority of such court, or to appear, or defend their claim or cause, the court shall, nevertheless, proceed to pronounce sentence or judgment, which shall, in like manner, be final and decisive, the judgment or sentence and other proceedings being in either case transmitted to Congress, and lodged among the acts of Congress for the security of the parties concerned; provided, that every commissioner, before he sits in judgment, shall take an oath, to be administered by one of the judges of the Supreme or Superior Court of the State, where the cause shall be tried, "well and truly to hear and determine the matter in question, according to the best of his judgment, without favor, affection, or hope of reward"; provided, also, that no State shall be deprived of territory for the benefit of the United States.

All controversies concerning the private right of soil, claimed under different grants of two or more States, whose jurisdiction as they may respect such lands and the States which passed such grants are adjusted, the said grants or either of them being at the same time claimed to have originated antecedent to such settlement of jurisdiction, shall, on the petition of either party to the Congress of the United States, be finally determined, as near as may be, in the same manner as is before prescribed for deciding disputes respecting territorial jurisdiction between different States.

The United States in Congress assembled shall also have the sole and exclusive right and power of regulating the alloy and value of coin struck by their own authority, or by that of the respective States—fixing the standard of weights and measures throughout the United States—regulating the trade and managing all affairs with the Indians not members of any of the States; provided that the legislative right of any State within its own limits be not infringed or violated—establishing and regulating post-offices from one State to another throughout all the United States, and exacting such postage on the papers passing through the same, as may be requisite to defray the expenses of the said office—appointing all officers of the land forces in the service of the United States excepting regimental officers—appointing all the officers of the naval forces, and commissioning all officers whatever in the service of the United States—making rules for the government and regulation of the said land and naval forces, and directing their operations.

The United States in Congress assembled shall have authority to appoint a committee to sit in the recess of Congress, to be denominated "a committee of the States," and to consist of one delegate from each State; and to appoint such other committees and civil officers as may be necessary for managing the general affairs of the United States, under their direction—to appoint one of their number to preside, provided that no person be allowed to serve in the office of president more than one year in any term of three years—to ascertain the necessary sums of money to be raised for the service of the United States, and to appropriate and apply the same for defraying the public expenses—to borrow money or emit bills on the credit of the United States, transmitting every half year to the respective States an account of the sums of money so borrowed or emitted—to build and equip a navy—to agree upon the number of land forces, and to make requisitions from each State for its quota, in proportion to the number of white inhabitants in such State; which requisition shall be binding, and thereupon the Legislature of each State shall appoint the regimental officers, raise the men, and clothe, arm, and equip them, in a soldier-like manner, at the expense of the United States; and the officers and men so clothed, armed, and equipped, shall march to the place appointed, and within the time agreed on by the United States in Congress assembled; but if the United States in Congress assembled shall, on consideration of circumstances, judge proper that any State should not raise men, or should raise a smaller number than its quota, and that any other State should raise a greater number of men than the quota thereof, such extra number shall be raised, officered, clothed, armed, and equipped, in the same manner as the quota of such State, unless the Legislature of such State shall judge that such extra number can not safely be spared out of the same; in which case they shall raise, officer, clothe, arm, and equip as many of such extra number as they judge can be safely spared. And the officers and men so clothed, armed, and equipped shall march to the place appointed, and within the time agreed on by the United States in Congress assembled.

The United States in Congress assembled shall never engage in a war, nor grant letters of marque and reprisal in time of peace, nor enter into any treaties or alliances, nor coin money, nor regulate the value thereof, nor ascertain the sums and expenses necessary for the defense and welfare of the United States or any of them, nor emit bills, nor borrow money on the credit of the United States, nor appropriate money, nor agree upon the number of vessels of war to be built or purchased, or the number of land or sea forces to be raised, nor appoint a commander-in-chief of the army and navy, unless nine States assent to the same; nor shall a question on any other point, except for adjourning from day to day, be determined, unless by the votes of a majority of the United States in Congress assembled.

The Congress of the United States shall have power to adjourn to any time within the year, and to any place within the United States, so that no period of adjournment be for a longer duration than the space of six months; and shall publish the journal of their proceedings monthly, except such parts thereof relating to treaties, alliances, or military operations, as in their judgment require secrecy; and the yeas and nays of the delegates of each State on any question shall be entered on the journal, when it is desired by any delegate; and the delegates of a State, or any of them, at his or their request, shall be furnished with a transcript of the said journal, except such parts as are above excepted, to lay before the Legislatures of the several States.

ART. 10. The committee of the States, or any nine of them, shall be authorized to execute, in the recess of Congress, such of the powers of Congress as the United States in Congress assembled, by the consent of nine States, shall from time to time think expedient to vest them with; provided that no power be delegated to the said committee, for the exercise of which, by the articles of confederation, the voice of nine States in the Congress of the United States assembled is requisite.

ART. 11. Canada, acceding to this confederation, and joining in the measures of the United States, shall be admitted into, and entitled to all the advantages of, this Union; but no other colony shall be admitted into the same unless such admission be agreed to by nine States.

ART. 12. All bills of credit emitted, moneys borrowed, and debts contracted, by or under the authority of Congress, before the assembling of the United States, in pursuance of the present confederation, shall be deemed and considered as a charge against the United States, for payment and satisfaction whereof the said United States and the public faith are hereby solemnly pledged.

ART. 13. Every State shall abide by the decision of the United States, in Congress assembled, on all questions which, by this confederation, are submitted to them. And the articles of this confederation shall be inviolably observed by every State, and the Union shall be perpetual; nor shall any

alteration at any time hereafter be made in any of them, unless such alteration be agreed to in a Congress of the United States, and be afterward confirmed by the Legislature of every State.

And whereas it has pleased the great Governor of the world to incline the hearts of the Legislatures we respectively represent in Congress to approve of and to authorize us to ratify the said articles of confederation and perpetual union: *know ye*, that we, the undersigned delegates, by virtue of the power and authority to us given for that purpose, do, by these presents, in the name and in behalf of our respective constituents, fully and entirely ratify and confirm each and every of the said articles of confederation and perpetual union, and all and singular the matters and things therein contained; and we do further solemnly pledge and engage the faith of our respective constituents, that they shall abide by the determinations of the United States in Congress assembled, on all questions which, by the said confederation, are submitted to them; and that the articles thereof shall be inviolably observed by the States we respectively represent; and that the Union be perpetual.

In witness whereof, we have hereunto set our hands, in Congress. Done at Philadelphia, in the State of Pennsylvania, the ninth day of July, in the year of our Lord one thousand seven hundred and seventy-eight, and in the third year of the independence of America.

NEW HAMPSHIRE.
Josiah Bartlett,
John Wentworth, Jr.

MASSACHUSETTS BAY.
John Hancock,
Samuel Adams,
Elbridge Gerry,
Francis Dana,
James Lovell,
Samuel Holton.

RHODE ISLAND.
William Ellery,
Henry Marchant,
John Collins.

CONNECTICUT.
Roger Sherman,
Samuel Huntington,
Oliver Wolcott,
Titus Hosmer,
Andrew Adams.

NEW YORK.
James Duane,
Francis Lewis,
William Duer,
Gouverneur Morris.

NEW JERSEY.
John Witherspoon,
Nath. Scudder.

PENNSYLVANIA.
Robert Morris,
Daniel Roberdeau,
Jonathan Bayard Smith,
William Clingan,
Joseph Reed.

DELAWARE.
Thomas McKean,
John Dickinson,
Nicholas Van Dyke.

MARYLAND.
John Hanson,
Daniel Carroll.

VIRGINIA.
Richard Henry Lee,
John Banister,
Thomas Adams,
John Harvie,
Francis Lightfoot Lee.

NORTH CAROLINA.
John Penn,
Cornelius Harnett,
John Williams.

SOUTH CAROLINA.
Henry Laurens,
William Henry Drayton,
John Matthews,
Richard Hutson,
Thomas Heyward, Jr.

GEORGIA.
George Walton,
Edward Telfair,
Edward Langworthy.

Confederation of the Rhine (in Germ. *Rheinbund*): the name of a league formed in July, 1806, by sixteen German states under the protection of Napoleon. The princes of these states signed an act of confederation, dissolving their connection with the Germanic empire and forming an alliance with the French emperor. They were the Kings of Bavaria and Würtemberg, the arch-chancellor, the Elector of Baden, Murat, Duke of Berg, the Landgrave of Hesse-Darmstadt, the Princes of Nassau-Usingen, Nassau-Weilburg, Hohenzollern-Hechingen, Hohenzollern-Sigmaringen, Salm-Salm, Salm-Kyrburg, the Duke of Aremberg, the Count of Leyen, and the Princes of Isenburg-Birstein and Lichtenstein. In Sept., 1806, the confederation was joined by the Elector of Würzburg; in Dec., 1806, by the Elector (subsequently king) of Saxony, and the Saxon Dukes of Weimar, Gotha, Coburg, Meiningen, and Hildburghausen; in 1807, by three Dukes of Anhalt, two Princes of Lippe, three Princes of Reuss, the Prince of Waldeck, and the new kingdom of Westphalia; in 1808, by the Dukes of Mecklenburg-Strelitz, Mecklenburg-Schwerin, and Oldenburg. The confederation had an area of 126,075 sq. miles, and a pop. of 14,608,877. In 1810 a part of the confederation was incorporated with France, and its territory reduced to 114,467 sq. miles, with 13,475,000 inhabitants. In consequence of the downfall of Napoleon the confederation was dissolved in 1813, and its members united with the other German states to form the Germanic Confederation.

Conference [viâ Fr. from a Mediæv. Lat. deriv. of *confer're*, bring together, compare, alluding to the different parties bringing together or comparing their thoughts]: the act of conversing on a serious subject; an oral discussion; a formal discourse; a meeting for consultation or instruction; a meeting of two branches of a legislature by their committee when they disagree respecting the passage of a bill. In such cases each house appoints a committee of conference, in order to settle the difference by a compromise. In English law, conference signifies also the interview of an attorney or solicitor with a counsel when consulting him.

In a political sense, conference denotes the meeting of plenipotentiary ministers of several states for the peaceable settlement of international complications. Of special importance in modern history are the conferences of Vienna, held in 1820 and 1834, the Paris conference of 1856, and the London conferences of 1864, 1867, and 1871. International conferences have also been held on many non-political questions during the nineteenth century. Among the most important of these are the conferences of Geneva, Aug., 1864, for the organization of the sanitary commission, and of Paris, June and July, 1867, for the examination of the monetary question.

Conference is also an ecclesiastical term used in various senses. In the Roman Catholic Church the term was formerly applied to certain assemblies of priests or canons presided over by an arch-priest or dean. They originated in the eleventh century, but are now seldom convened.

Pastoral Conferences are meetings held annually, quarterly, or monthly by pastors of various Protestant churches for the discussion of pastoral duties, and for other similar purposes. They are held in the French Protestant churches, also among English Dissenters, and in many churches of the U. S., etc.

The Wesleyan Church in England has an annual meeting of its preachers called the "conference," which has administrative and other powers, defined by Wesley's Deed of Declaration (1784). A similar conference is held in Ireland. (See Stevens, *History of Methodism*.) In the Methodist Episcopal Church and the Methodist Episcopal Church South a General Conference meets every four years. It has full power to make rules and regulations, subject to certain restrictions found in the *Discipline*, part ii., chapter 1. It is presided over by the bishops. In the same churches the territory where preachers are stationed is divided into conferences, which are again divided into districts. The preachers and certain lay delegates of each conference meet in an annual conference, where preachers receive their appointment for the year from the presiding bishop. There are quarterly conferences held in each circuit or station.

General (triennial) and annual conferences are also held by the Free-will Baptists, and yearly conferences by the Six-principle Baptists, the minor Methodist bodies, and others.

The Conference of Hampton Court, in 1604, was a meeting of King James I., nine bishops, and nine other divines of the Anglican Church, and four Puritan theologians, held with reference to the differences between the Anglicans and the Puritans. This meeting led to some slight changes in the Anglican Liturgy.

The Savoy Conference at the palace of the Bishop of London in the Savoy, in 1661, consisted of thirteen Anglican bishops and eleven Nonconformist divines, with a number of other theologians on each side as counselors. Instead of healing the breach, the Savoy Conference (*q. v.*) increased the differences between the two parties.

The Evangelical Church Conference (*Evangelische Kirchenconferenz*) is the name given to the regular (annual or biennial) meetings of delegates of the governments of the German states and Austria-Hungary for the discussion of important Church questions.

Conference, Wesleyan: See Methodism.

Conferva [Lat. *confer'va*, a water-plant mentioned by Pliny]: a genus of fresh-water algæ, of the family *Ulotrichiaceæ* and order *Confervoideæ*. As now restricted the genus includes twenty-five to thirty species of filamentous, unbranched, green, aquatic plants, which reproduce by means of zoöspores, produced apparently by any of the cells. The zoöspores after a period of activity come to rest, and, inclosing themselves in a wall of cellulose, develop directly into new plants. In some related genera other zoöspores come together in pairs, and after fusing into a single mass the whole becomes covered with a thick wall, thus constituting a resting-spore. This process probably occurs in Conferva, but has hitherto escaped observation.

Formerly the name Conferva included all the filamentous green algæ, and it is still so used popularly, but scientifically it is restricted as above. Confervæ are abundant in springs, brooks, rivers, ponds, and lakes, and, while typically inhabitants of fresh waters, a few are found in saline springs.

Charles E. Bessey.

Confession [from Lat. *confessio*, deriv. of *confite'ri*, acknowledge; *con*, intensive + *fate'ri*, avow, connected with *fā'ri*, Gr. *φάναι*, assert]: the declaration of one's sins to a duly authorized priest with a view of obtaining absolution. Confession, thus understood, is only a part of the sacrament of penance. Roman Catholics and the Eastern Churches hold that confession is of divine institution, and therefore imposed by Church authority in the fourth Lateran Council (1215 A. D.), and that it was practiced from the very beginning of Christianity. Confession must (1) be *entire*, i. e. must include all the mortal sins committed after baptism, so far as the penitent can recall them by a diligent examination of conscience; (2) *humble* and *sincere*, and (3) accompanied by *supernatural sorrow* for sin, and a *firm purpose* of amendment for the future.

Most Protestants assert that such confession is not enjoined in the New Testament. The Greek Church regards this discipline as necessary for the reception of the Eucharist. The Lutheran professes that private confession may be retained in the Church, but that particular statement of sin is not necessary. The Church of England employs a general form of confession in its services, but retains private confession in the rubric for visitation of the sick. The Scottish and most of the other Protestant Churches do not recognize it at all.

The SIGILLUM CONFESSIONIS (seal of confession) in the Roman Catholic Church means the obligation of a confessor or priest not to divulge the secrets of the confessional. This obligation rests, 1, on the natural ethical law; 2, on positive divine law (for it belongs to the very essence of this sacrament); 3, on ecclesiastical law, promulgated at least as early as A. D. 527, in the synod of Dovin, Canon 20 (Hefele, *Councils*, vol. ii., p. 718), and reaffirmed in the fourth Lateran Council. A violation of this law by a priest would make him subject to the severest ecclesiastical penalties.

Revised by JOHN J. KEANE.

Confession: in criminal law, an admission by a person that he has committed or participated in a crime. Confessions are either judicial or extra-judicial. It is said to be judicial when made before a magistrate or in court in the course of legal proceedings, as where the prisoner pleads "guilty." An extra-judicial confession does not have the same weight as one that is judicial, and is insufficient for conviction unless corroborated by proof of the actual commission of the offense (*corpus delicti*). A confession must be voluntary—that is, not elicited by the influence of fear or hope of favor applied to the prisoner by one having authority, such as a public official or the party against whom the act was committed (prosecutor). A confession made by a person under oath is not admissible, as it is held that he is then under a species of restraint. It is not necessary that it should be spontaneous, nor that a warning should be given to the person making it that it will be used against him. The question of the admissibility of a confession in evidence is decided by the judge; its credibility after its admission is determined by the jury. Revised by F. STURGES ALLEN.

Confessional: in the Roman Catholic Church, a place reserved for the hearing of confession with a seat for the priest and a place for the penitent to kneel. This has been commonly since the Middle Ages an inclosed cabinet or closet of wood, sometimes ornamental, and forming part of the church furniture. The priest's compartment has a penitent's compartment on each side of it.

Confession of Faith: See CREED.

Confines, AUDIENCE OF THE (Sp. *Audiencia de los Confines*): the supreme Spanish court of the Central American region. When the "new laws" were promulgated in 1542 it was ordered that the audience of Panama should be abolished, its functions being divided between the two audiences of Los Reyes (Lima) and Los Confines (Central America). The latter had jurisdiction over Chiapas, Yucatan, Guatemala, Honduras, Nicaragua, and Castilla del Oro (Isthmus of Panama). Its powers were very great. In criminal cases there was no appeal from it, and in civil cases an appeal lay to the Council of the Indies only in cases involving over 10,000 *pesos de oro*. It appointed temporary governors, and was superior to the crown governors on all legal points, being, in fact, the highest representative of the king in Central America. It consisted of four *oidores* (auditors or judges), one of whom, as president, practically ruled the others. Comayagua was chosen for the seat of this audience, but it was found inconvenient, and the first session was held at Gracias á Dios in 1545. In 1549 it was changed to Guatemala, where it remained until the revolution, except from 1563–70, when it was at Panama. The new audience of Panama, established in 1595, took the isthmus region from the Audience of the Confines.

HERBERT H. SMITH.

Confirmation, or **Laying-on of Hands** [*confirmation* is from Lat. *confirma'tio*, deriv. of *confirma're*, make firm, establish]: a sacramental rite evidently referred to in the Epistle to the Hebrews (vi. 1, 2), as one of "the principles of the doctrine of Christ." Notices of the administration of this rite are found in Acts viii. 5–20; xix. 1–8. In primitive times, and still in the Eastern Church, this rite was known as the "seal" and the "unction of the Spirit"; and under these names it appears to be alluded to again and again in the New Testament (e. g. 2 Cor. i. 21; Eph. i. 13; iv. 30; 1 John ii. 20, 27). Notices of the continued and universal use of this rite are found in Tertullian (A. D. 196–201), who, after describing the manner of baptizing as practiced in his day, adds, "Next to this the hand is laid upon us, calling upon and inviting the Holy Spirit through the blessing" (*De Bapt.* viii. 7–8). There can be no doubt, from the testimonies of the Fathers, that this rite, universally observed in the apostolical Church, was continued in use, the Church believing that, although the miraculous gifts which at first sometimes attended the rite had ceased to be seen, the more important, because more lasting, graces of the Holy Spirit were still conveyed. As St. Augustine says (*Pol.* v., lxvi. 4), "Not by gifts of tongues is the Spirit known in the laying on of hands, but invisibly and secretly it is felt." In the Eastern Churches it has always been the practice to administer confirmation directly after baptism, or as soon after as might be; but in the East priests were permitted to administer confirmation, using chrism consecrated by the bishop. In the West the rite of confirming was restricted to the bishop in person. Bede informs us that in his time, the early part of the eighth century, after the special seasons of baptism—Easter and Whitsuntide—the bishop made a visitation of his diocese for the purpose of confirming those just baptized. The pontifical of Egbert, Archbishop of York, *circa* 750, contains the confirmation service of the English Church at that period. The earliest confirmation service extant is found in the Gelasian Sacramentary (A. D. 492). Its opening words, closely followed in the English and American confirmation offices, are: "Then (after baptism) by the bishop is given to them (the baptized) the sevenfold Spirit. He lays his hand upon them to seal them with these words: 'Almighty God, Father of our Lord Jesus Christ, who hast regenerated thy servants by water and the Holy Ghost, and hast given them remission of all their sins, thou, Lord, send unto them thine Holy Ghost the Comforter, and give them the spirit of wisdom and understanding, the spirit of counsel and fortitude, the spirit of knowledge and piety, fill them with the spirit of the fear of God, in the name of the Lord, with whom thou livest and reignest, God, ever with the Holy Ghost, through all ages of ages. Amen.'" Anointing with chrism in the sign of the cross on the forehead was of very early use in the administration of the rite, but the laying on of hands was the essential act. All three were in use in the English Church down to the end of the reign of King Henry VIII. In the first book of King Edward VI. the chrism was discontinued. "Then the bishop shall cross them on the forehead, and lay his hand upon their heads." In the second book of King Edward VI. the crossing was also discontinued. "Then shall the bishop lay his hand upon every child 'severally.'" The office in the English and American Prayer-books is almost identical. In the American revision of 1892 the use of the "preface," originally a rubric, is made permissive instead of being mandatory; a form of presentation to the bishop is added, and the reading of the account of the laying on of hands given by St. Luke in Acts viii. is required. A rubric is added at the close of the service as follows:

"*The minister shall not omit earnestly to move the persons confirmed to come, without delay, to the Lord's Supper.*"

W. S. PERRY.

Confiscation [from Lat. *confiscatio*, deriv. of *confisca're*, confiscate; *con* + *fiscus*, basket, receptacle for money, treasury]: the forfeiture of land or other property to the public treasury as part of the punishment of certain crimes. During the French Revolution a large quantity of land owned by the Church was confiscated—i. e. was taken from the Church in order to convert it into a source of national revenue.

Conflict of Laws: See International Law, Private.

Confucianism: the ethico-political system of Confucius (*q. v.*), sometimes erroneously called a "religion," and described as "one of the three religions of China." This erroneous notion had its origin in the imperfect information of those who wrote about China in the early days of foreign intercourse with that country, and has been perpetuated by other more modern writers, who needlessly include in the term the ancient religion of China which had been in existence for more than two thousand years before Confucius, and with which he had nothing to do, as well as the teachings of the sage himself. His saying, "Respect the gods! but have as little as possible to do with them," represents his position in regard to religion.

The key to the Confucian teaching is found in the state of the empire in his day. The house of Chow, which had come to the imperial throne about 1122 B. C., had lost all influence with the feudal princes, who warred with each other or against the emperor. "Right principles," Mencius tells us, "had faded away, and oppression and bloodshed prevailed." To remedy this state of things, to renovate the people, and inaugurate a time of universal peace and prosperity, was what Confucius aimed at. "Fond of antiquity and earnest in seeking knowledge there," he had observed that in the good old times of "the ancient kings" peace and prosperity were found hand in hand with beneficent government, the observance of "the rules of propriety," and the cultivation of virtue. Yao and Shun, twenty-three centuries B. C., had blotted evil, and poverty, and ignorance out of the empire simply by their virtue and example. "The upright were advanced to office and the crooked set aside." The result was "universal concord," a kind of golden age, which might again be brought about by imitating the ancient kings. Hence his inculcation of the five cardinal virtues, the observance by all classes of the duties pertaining to the five relationships of life, viz., those of ruler and subject, parent and child, husband and wife, brother and brother, and friend and friend.

"When the prince is prince," said Confucius, "and the minister is minister, when the father is father, and the son is son," then there is good government, and having good government righteousness will prevail and the people will be happy. The system of Confucius can perhaps best be shown by an extract from the *Ta Hioh*, or "Great Lesson," a fragment of 275 words attributed to Confucius, and commented on by Tsŭng Sin, a disciple. The object of this great lesson is said to be "to illustrate illustrious virtue, to renovate the people, and to rest in the highest excellence." It says:

"The ancients who desired to illustrate illustrious virtue throughout the empire first ordered well their own states. Wishing to order well their own states, they first regulated their families. Wishing to regulate their families, they first cultivated their own persons. Wishing to cultivate their persons they first rectified their hearts. Wishing to rectify their hearts, they first sought to be sincere in their thoughts. Wishing to be sincere in their thoughts, they extended their knowledge to the utmost; and this extension of knowledge lay in the investigation of things. Things being investigated, knowledge became complete. Their knowledge being complete, their thoughts were sincere. Their thoughts being sincere their hearts were then rectified. Their hearts being rectified, their persons were cultivated. Their persons being cultivated, their families were regulated. Their families being regulated, their states were rightly governed. Their states being rightly governed, the whole empire was made tranquil and happy. From the emperor down to the mass of the people, all must consider the cultivation of the person the root of everything besides." *Chinese Classics*, translated by J. Legge, vol. i., p. 222.

Wŭn Wang, the founder of the Chow dynasty, in the twelfth century B. C. illustrated these principles. The commentator tells us that as a sovereign he rested in benevolence, as a minister in reverence, as a son in filial piety, as a father in kindness, and in communication with his subjects in good faith.

Confucianism concerns itself exclusively with man, first as an individual, and second in his relation to the family and the state, and makes no attempt to solve the problem of his origin and destiny. Its highest good is the temporal wellbeing of the community. See Legge's *Chinese Classics* and Faber's *Systematical Digest of the Doctrines of Confucius* (Hongkong and London, 1875). R. Lilley.

Confu'cius [Latinized form of Chinese K'ung-fu-tsze, the Master K'ung]: Chinese philosopher; b. B. C. 551 in Lu, one of the feudal states into which China was then divided, now a part of the province of Shantung. Though he did not himself commit his teachings to writing, thanks to the pious care with which his disciples recorded not only his sayings but also his manner of life hardly any character of antiquity is so well known to us. His father, a soldier distinguished for deeds of strength and daring, died when Confucius, the child of his old age by a second marriage, was only three years old, leaving him to his mother's care. He married at the age of nineteen, and for two years held subordinate posts in the public service. At twenty-two he entered on what was to be the chief occupation of his life—that of a public teacher. To all who resorted to him he gave instruction, however small the fee offered, if only they gave evidence of capacity and zeal for improvement. As his fame spread abroad the number of his disciples increased, until it is said at one time to have reached 3,000. The political disorders growing out of the quarrels of the feudal states, which the authority of the emperor was too weak to restrain, naturally directed his attention to the principles of good government, and this became one of his most frequent topics of discourse. At the age of fifty-one he was made chief magistrate of the town of Chung-tu, and had at length an opportunity to put his theories into practice. The immediate and marked improvement in the manners of the inhabitants led to his advancement, first to the post of assistant superintendent of public works and next to that of minister of crime in Lu. Here also similar results followed, but the jealousies and fears of the neighboring states were now aroused, and unworthy means were taken to create a breach between the Marquis of Lu and his minister. Confucius, finding it impossible to retain his office with dignity, withdrew from Lu, and for thirteen years journeyed from one to another of the neighboring states, everywhere received with honor, but nowhere finding a ruler willing to be guided by his counsels. He returned to his native state B. C. 483, and until his death in 478 was mainly occupied with literary pursuits. He had been all his life a student of the early history and literature of his country, and the editorship of four of the "five classics" is with more or less justice ascribed to him, while the fifth, the *Spring and Autumn Annals*, a brief record of events in Lu from 721 to 480 B. C., is his own work, though hardly worthy of his reputation.

The principal source of our knowledge of his character and teaching is the *Lun yu*, which might be aptly styled the "Memorabilia of Confucius." Two other of the "four books"—the *Great Learning* and the *Doctrine of the Mean* (the latter ascribed to K'ung Keih, the grandson of Confucius)—contain digests of his teaching, but in a less original and therefore for us less valuable form. Confucius put forward no claim to originality. He spoke of himself as a "transmitter and not a maker, believing in and loving the ancients"; again, "I am not one who was born in the possession of knowledge; I am one who is fond of antiquity and earnest in seeking it there." This reverence for antiquity extended even to its forms and ceremonies, in the observance of which, however, his evident sincerity preserved him the appearance of formalism. He was preeminently a teacher of ethics. The whole tendency of his mind was practical rather than speculative. We are told that "there were four things which he taught—letters, ethics, devotion of soul, and truthfulness." He held to the native goodness of human nature, and his system of morals rested on no sanctions of future rewards and punishments. Many of his recorded sayings are admirable, but of highest value is his enunciation of the "golden rule." One of his disciples asked, "Is there one word which may serve as a rule of practice for all one's life?" The master said, "Is not *reciprocity* such a word? What you do not want done to yourself do not do to others." The progress of his own development he has thus described: "At fifteen I had my mind bent on learning; at thirty I stood firm; at forty I had no doubts; at fifty I knew the decrees of heaven; at sixty my ear was an obedient organ; at seventy I could follow what my heart desired without transgressing what was right."

The reserve with which Confucius spoke of man's relation to the powers above and of the future life may be due in part to the influence of the early Chinese religion. This, like the Government, was patriarchal in character; the emperor, as the representative of his people, alone offered sac-

rifices to heaven, while the popular religion was little more than ancestor-worship. But Confucius was also, by the native temper of his mind, inclined to positivism and secularism. Among the subjects on which he did not talk were "extraordinary things" and "spiritual beings." One of his disciples, Ki Loo, "asked about serving the spirits of the dead. The master said: While you are not able to serve men, how can you serve their spirits? Ki Loo added: I venture to ask about death. He was answered: While you do not know life, how can you know about death?" This attitude he has communicated to his followers, and that the Confucianists have escaped the degrading superstitions and magical practices into which the Bûddhist and Taoist sects of China have fallen is largely due to the influence of Confucius.

Measured by any standard, a high ethical value must be accorded to the teaching of Confucius. It was, moreover, peculiarly adapted, even in its limitations, to the genius of the Chinese people, already predisposed, like himself, to the conservatism which he has done so much to strengthen. But his teaching alone, even with the aid of his strong personality, would hardly account for the vast influence which he has held and still continues to hold over the Chinese mind. To explain this we must take into account also the place which the classical books, and through them the doctrines of Confucius, occupy in the educational and administrative systems of China. For centuries they have been the foundation, and we might almost say the sum, of the instruction given in the schools, and the main subjects in the examinations which guard the entrance to and regulate promotion in the public service. The Government by lavish honors paid to his memory has added further to the weight of his authority. His family is ennobled, and the oldest representative in the direct line has the rank and revenues of a duke, the sole hereditary dignity of Chinese origin which was respected by the reigning Manchu dynasty. Twice a year the emperor himself makes offerings in his honor in the hall of the imperial college at Peking. Temples dedicated to him are attached to the examination halls, more than 1,500 in number, scattered throughout the empire. In Japan and Korea also, among the educated classes, his authority as a teacher is hardly less than in his native land.

Literature.—Legge's *Chinese Classics*, vol. i., also his *Religions of China*; Douglas, *Confucianism and Taouism*; Plath, *Confucius und seiner schüler Leben und Lehren.*

Addison Van Name.

Congaree': a river of South Carolina; is formed by the Broad and Saluda rivers, which unite at Columbia. It flows southeastward, and joins the Wateree to form the Santee river. Steamboats ascend the Santee and Congaree rivers to Columbia.

Congé d'élire, kōn'zhā'dā'leer': a French phrase signifying "permission to choose," is the name given in England to the king's warrant or license to the dean and chapter in the older dioceses to elect a bishop for a vacant see. The king's warrant, however, always contains the name of the person whom the dean and the chapter are to elect, and they have, according to 25 Henry VIII., c. 20, no means whatever of asserting a wish of their own.

Congenital Diseases: diseases produced or existing at birth. These conditions are to be distinguished from hereditary affections, and from malformations of the infant, which result either from arrested development or disease contracted during intra-uterine life; they are described elsewhere. Congenital diseases proper may be classed as follows: First, those transmitted from a diseased mother before or during birth: such as syphilis, various conditions caused by a septic puerperal infection, and gonorrhœal infection. Second, those acquired shortly before birth; such as acute general fatty degeneration of the fœtus and newly born, and tumors of various kinds. Third, those acquired during birth, without direct maternal influence; such as asphyxia, atelectasis (unexpanded condition of the lungs), and cephalhæmatoma, or a sanguineous tumor of the head. Syphilis may affect the infant by transmission from the mother to it at any period of intra-uterine life. When the genital tract of the mother is infected with a syphilitic ulcer, the child in passing through it may develop a primary infection. Antisyphilitic treatment is urgently indicated in all cases. From a septic puerperal infection of the mother a direct transmission to the child may occur, in consequence of which a puerperal erysipelas, an infective peritonitis, a septic jaundice with inflammation of the umbilical vein, a purulent inflammation of the eye, and a pyæmic condition with the formation of multiple abscesses, may be developed; these are several of the manifestations resulting from the same cause, as seen in different infants. They are all accompanied with high fever, and generally soon terminate fatally. Gonorrhœa, when affecting the vagina of the mother, gives rise to the most dangerous form of purulent inflammation of the infantile eyelids, which unless immediately treated, is apt to result in blindness. In this condition the eye must be frequently opened and washed with mild antiseptic lotions; also applications of nitrate of silver solution, and ice-water soaked pads locally. An acute general fatty degeneration of numerous organs is not frequently seen; the epithelium of lungs, bronchial tubes, uriniferous tubes of kidneys, intestine, liver cells, blood-vessels, or even the whole body may be affected. Such a condition interferes with the normal functions of these parts, and usually terminates fatally; uncontrollable hæmorrhages from the stomach, bowels, or umbilical cord, frequently being the direct cause of death. Congenital tumors are rather frequent, and generally call for operative interference. Asphyxia is a condition most frequently observed after protracted labors, especially in those cases due to abnormal presentation of the infant, where the breech or lower extremities are born before the head. This oftentimes causes a greater or less degree of compression of the umbilical cord, resulting in a temporary or permanent arrest of its circulation, and consequent premature respiratory movements. Thus the child is born almost or apparently lifeless, blue or pale, with no respiratory attempts, and possibly no pulsation of the heart. This condition demands immediate application of respiratory stimulants, or artificial respiration. Slapping the buttocks, alternate immersion in warm and cold water, slapping the chest with a wet cloth, forcible swinging in the air, electric current to the chest, etc., may induce respiratory movement. Artificial respiration by Marshall Hall's, Sylvester's, or Howard's method, or by mouth to mouth inflation, is of value. Atelectasis is the result of an absence of the normal expansion of the lungs, following the entrance of air. This condition may be caused by an insufficient development of the chest muscles, or their innervation may be faulty, due to some disease of the brain; the lungs may be the seat of an inflammation, or they may be filled with mucus, or some foreign substance aspirated during birth, such as blood, mucus, amniotic fluid, etc. To relieve this condition, emetics cause a discharge of the foreign matter, tickling the fauces frequently sufficing. To excite nerve action the electric current is used, and mustard plasters are applied locally. Cephalhæmatoma may result from one of two causes. The external layer of the cranial bones of the new-born, being but slightly developed, affords but little protection to the blood-vessels ramifying in it, and in consequence of which little violence, and sometimes practically none at all, is necessary to cause a rupture. Or a hæmorrhage due to one of many causes may occur between the bone and its periosteum, or enveloping membrane; this extravasation of blood, small at first, may in the course of from four to six days increase to the size of a walnut or small apple. Such hæmorrhages are most common near one of the parietal bones. The condition in itself is usually not dangerous, and the extravasation will generally be absorbed in from four to ten weeks if undisturbed. Surgical interference is but rarely indicated, and is apt to result in suppuration unless the most stringent antiseptic measures are observed.

A. Jacobi and F. E. Sondern.

Conger: a marine eel, *Conger conger*, having a more pointed tail than the common species. The skin is scaleless; head depressed and pointed; mouth deeply cleft; under jaw slightly projecting beyond the upper; outer series of teeth in either jaw so closely set as to form a cutting edge. Color dark brown above, dirty white below: dorsal and anal fins pale, edged with black, or sometimes entirely black. It is a widely distributed species, being found on the coasts of Europe, Japan, Tasmania, and the Eastern U. S., preferring a rocky bottom. It reaches a length of 8 feet and a weight of 100 lb., and, although not particularly good eating, is sometimes used for food in Great Britain, the principal fishery being off the Cornish coast. It is voracious, active, and powerful, and large specimens require careful handling when caught. It seems remarkably susceptible to cold. In California the name is applied to *Sidera mordax*, one of the Murænas, and in the Eastern U. S. to *Zoarces anguillaris*, the eel-pout.

F. A. L.

Congestion [from Lat. *conges'tio*, deriv. of *conge'rere*, carry together, heap together]: in pathology, fullness of blood or repletion of the blood-vessels. Congestion may be arterial or active when the over-filling of the vessels is due to increased flow of blood to the part, or passive or venous when it is due to obstruction to the outflow of blood. Active congestion results from excitement of the circulation by emotional disturbances, exercise, alcohol or other poisons, from exposure to cold, or direct irritation of the part; passive from mechanical obstruction of the circulation; and localized passive from pressure upon the venous trunks of different parts. When active the affected part is light red in color; when passive the color is dark red or bluish. W. P.

Congestive Chill: See CHILL.

Con'gleton: a market-town of Cheshire, England; in a deep valley on the river Dane; 22 miles S. of Manchester (see map of England, ref. 8–G). It has manufactures of silk ribbons and other silk fabrics. Pop. (1891) 10,744.

Congleton, HENRY BROOKE PARNELL, Lord: British statesman; b. July 3, 1776; for many years a Liberal member of Parliament. He became Secretary at War in 1830, and paymaster of the forces in 1835. He was well versed in financial affairs, and wrote several works, one of which was *On Financial Reform* (1830). Committed suicide June 8, 1842.

Conglomerate: See SANDSTONE.

Congo Eel: See CONGO SNAKE.

Congo Free State: an area in Central Africa embracing two-thirds of the Congo river basin. It was constituted and defined under this name in 1885 by the International Congo Conference at Berlin, and was placed under the sovereignty of the King of the Belgians as an individual, but he bequeathed all his rights to Belgium, and she has reserved the right of annexing the state after 1900. See below

Area and Boundaries.—The state includes a small strip along the lower Congo from the coast. From lon. 14° E. the boundary follows the Congo to the mouth of the Ubangi, then the Ubangi and Mbomu to Lado on the Nile; thence S. to Lake Bangweolo, or Bemba; thence westward to the Kassai river in 24° E. lon.; then along the Kassai to 7° S. lat.; then westward to the Kwango river in about 8° S., down which the boundary follows to 5° 50′ S.; thence W. to the Congo, and down that stream to its mouth. The area is estimated at 802,000 sq. miles, making it nearly one thirteenth of Africa. This enormous area is varied, having only the two common characteristics of being tropical and of being included in the basin of a single river. Civilized control extends over most of the larger rivers; in other parts of the state the numerous wild tribes are entirely uncontrolled, and to some extent unvisited. One of the purposes of the original formation of the state was the suppression of the slave-trade, and this has been fairly accomplished, not, however, so much by interior control as by watchfulness in the British, German, French, and Portuguese territories that surround it, except to the north.

Government.—The central government is at Brussels, and consists of its sovereign, the King of the Belgians, and the heads of the departments, namely, the Ministers of Foreign Affairs and Justice, of Finance, and of the Interior. There is also a local government comprising a governor-general and vice-governor, a state inspector, a general secretary, a director of justice, a director of finance, and a commander of the forces. The local capital is Boma, 50 miles from the river mouth. There are fifteen administrative divisions. There is an armed force of 6,120 blacks, commanded by white officers. There are about sixty steam vessels on the lower and upper Congo. Navigation for the lower Congo ends at Matadi, 90 miles up the river. From this to Stanley Pool or Leopoldville it is unnavigable because of rapids. Between these points a railway has been built, and was opened for business in June, 1898. It is 235 miles long, and runs about 30 miles S. of the river. A regular steamer service connects the state with Europe, and it is included in the postal union.

Trade and Commerce.—The principal articles of export are palm-oil, rubber, ivory, orchilla, copal, ground-nuts, cam-wood, and coffee. The general exports amounted in 1895 to 12,135,656 francs; in 1898 to 22,354,005 francs. The chief articles exported were ivory, rubber, palm-oil, and nuts. The imports, chiefly from Belgium, in 1898 aggregated 23,207,281 francs. The population is probably about 10,000,000.

Revenue.—The revenue is derived (1) from a subsidy of 1,000,000 francs by King Leopold; (2) from advances of 2,000,000 francs annually for ten years, promised by the Belgium Government; (3) from taxes; and (4) from the sale, etc., of public lands. Revenue (1899) 20,087,782 francs; expenditure, 19,842,087 francs.

REFERENCES.—Stanley, *Through the Dark Continent* (2 vols., 1878), and *The Congo and the Founding of its Free State* (2 vols., 1885); Tisdell, *Report on the Congo Country* (1885), in *Reports of the Consuls of the United States*; Pechuel-Loesche, *Kongoland* (1887); Alexis, *Le Congo Belge* (1888); Wissmann, *Im Innere Afrikas* (1888); Dupont, *Le Congo* (1889); Jeannest, *Quatre années au Congo* (1889); Ward, *Five Years with Congo Cannibals* (1890); White, *The Development of Africa* (1890). M. W. HARRINGTON.

HISTORY.—As an independent sovereignty, recognized by the powers, the Congo Free State dates from 1884. Its origin is to be found in the companies formed for trade and exploration in that region. The first of these was the African International Association, founded in 1877. The plan of this company was to send several exploring parties into the interior from the east coast, and to erect a line of stations along their routes. In 1878, after Stanley's return to Europe, another society was formed to study the country, its native tribes, its possibilities of travel and transportation, and its commercial resources. This was called the Comité d'Études du Haut Congo. It became the International Association of the Congo. In 1879 this second association sent Stanley up the great river. He and his men explored much more of the country, founded stations, built roads, and made over 400 treaties with native chiefs. These treaties conveyed the sovereignty which resided in the petty chiefs, contracting parties of the one part, to the International Association of the Congo, of the other. It then appealed to the powers to enable it to combine these many little sovereignties into one independent state.

The U. S. led the way. The Committee on Foreign Relations reported to the Forty-eighth Congress that the acts of cession of the native chiefs were within their rights, and that the association could lawfully accept them. This Government accordingly, Apr. 22, 1884, recognized the International Association of the Congo as a sovereign and independent power under the title of the Congo Free State. Within a year Austria, France, Germany, Great Britain, Italy, the Netherlands, Portugal, Russia, Spain, and Sweden followed the example of the U. S. Both France and Portugal, whose territories adjoin the Free State, made treaties of delimitation with it. Though an independent power, this new state, from th nature of its origin, from the objects of its formation, and from its dependence upon its sponsor, Belgium, occupies a position unlike that of any other member of the family of nations. Its character was constituted and defined by the general act of the International Congo Conference, signed at Berlin Feb. 26, 1885. It was thereby declared neutral and free to the trade of all nations, though the powers reserved for twenty years the right to decide as to the freedom of imports from taxation. The free navigation of the Congo and its affluents was provided for under an international commission. Religious freedom was proclaimed. Equality of treatment was promised to all settlers of whatever nationality. The slave-trade and slavery were to be assailed, the education and civilization of the natives attempted. All the powers represented at the conference ratified this important act except the U. S., which excused itself on the ground that such action would impose upon it international obligations at variance with its traditional policy.

In Apr., 1885, Leopold II., King of the Belgians, became sovereign of the Congo Free State; by will, Aug. 2, 1889, however, he bequeathed to Belgium all his sovereign rights over it. On July 31, 1890, the territories of the state were declared inalienable; a convention earlier in the same month between the two had reserved to Belgium the right of annexing the Congo State after ten years. There is a peculiar propriety in this close connection with Belgium, since both are declared perpetually neutral under the protection of the powers.

To provide revenue the International Conference at Brussels, 1890, participated in by seventeen powers, authorized the Congo State to levy duties on certain imports. By treaty of amity, commerce, and navigation, 1891, the U. S. provides for commercial intercourse and a consular system, accepts the laying of import duties, and agrees to settle by arbitration any dispute arising under the treaty.

THEODORE S. WOOLSEY.

Congo River: the second largest river in Africa, the knowledge of which (not yet complete) is due to modern explorations, especially those of Stanley. It receives various names in different parts of its course. It begins in the Chambezi river, which rises in about lat. 9° S., lon. 32° E., in the mountains S. of Lake Leopold, or Hikwa, between Tanganyika and Nyassa. This flows S. W., and is lost in Lake Bangweolo, or Bemba. Beyond this lake it reappears as the Luapula (believed by Delcommune to be the main stream), which flows northward into Lake Moero. Passing through this it reappears as the Luvua, and still flowing northward receives in its course the great Lualaba river, and takes its name. The Lualaba, which rises far to the S. (about lat. 12° S. and lon. 25° E.) and passes through a string of little-known lakes on its northward course, may be the main stream. From about lat. 4° S. its course has been explored, and it is known to be the Congo. From this point it is a noble stream, full of islands and sometimes dividing into two or more parts. At the equator there is a series of falls and cataracts called the Stanley Falls. From this place it passes northwestward to lat. 2° N., then southwestward to Stanley Pool (Leopoldville) in lat. 4° S., a distance of 1,000 miles or more, all navigable, and in this distance it receives the four great tributaries, the Lubilash (or Lomami) from the S., the Novelle (called Arnwimi at its mouth) from the E., the Ubangi (or Mobangi) from the N., and the Kwa (or Kassai) from the E. From Stanley Pool to Vivi, a distance of 200 miles or more, it is not navigable. From Vivi to the mouth, 90 miles, navigation is free. There is no delta; in this the Congo differs from the other great African rivers—the Nile, Niger, and Zambesi. The total length has been estimated at 2,900 miles, of which not more than half is navigable. The whole basin has an area of about 1,200,000 sq. miles. The Congo Railroad, passing around 235 miles of rapids in the lower Congo, was completed in July, 1898, giving steam communication with Europe.

Congo Snake, or **Congo Eel**: a popular name in the Southern U. S. for *Amphiuma means*, a slender eel-like batrachian, inhabiting the swamps and rice-fields of the Southern U. S., where it burrows in the soft mud. The animal reaches a length of 2 feet, has gill openings, four rudimentary limbs, with two or three toes on each, and a smooth slaty black skin, a little lighter on the under side.

Congregation of Clugny: See CLUNIACS, THE.

Congregationalism: a system of Church polity which embraces the principle of self-government in the local church, and the duty of churches to stand in fellowship or communion with one another. It gives to each congregation the right of regulating, without external interference, the details of its worship and discipline according to its own understanding of the principles of the New Testament, while it inculcates the duty of maintaining the fraternal communion of separate assemblies of believers, especially of such as profess the same faith and accept the same order.

According to the fundamental principle of Congregationalism, any association of believers, united by formal covenant for mutual watchfulness and help, the maintenance of divine worship, the observance of Christian rites, and combined efforts to promote the kingdom of God, is a Church of Christ, and as such is competent to elect and ordain its own officers, admit or reject applicants for membership, exclude unworthy members, control its own property, and transact its own business. The orderly prosecution of church-work calls for the appointment of various officers, on whom is laid the special responsibility of oversight and direction; and long usage, based upon the instructions of the New Testament, recognizes the office of pastor and that of deacon as needing to be perpetuated in the Church. The pastor holds the office of a bishop or elder. By virtue of his ordination he becomes a minister, whose function is not only to preach but to officiate in the administration of sacraments, as well as at the marriage service and the burial of the dead; and this rank of a minister he retains, even though his position as a pastor of a particular church may have been resigned. On this point, it may be remarked, an opposite view was prevalent in the early days of New England. Ordinarily each church has but one pastor, and for his support provision is made in the form of a stipulated salary, voluntarily contributed by the congregation. Among ministers, whether installed as pastors or not, there is no disparity of rank. The deacons are not salaried officers, nor technically ministers, but they are helpers of the pastor, and have special charge of receiving the charities of the church, and making distribution for the relief of the poor. They receive from the minister and hand to communicants the bread and wine at the Lord's Supper.

The Congregational system holds to the Holy Scriptures as the sufficient and exclusive rule of ecclesiastical polity, but leaves to the discretion of churches to establish forms and arrangements which are deemed expedient, provided they are not repugnant to the teaching of the Bible. It recognizes no organized and visible Church apart from local and particular assemblies of believers, and repudiates all claims of superior bodies to exercise legislative or judicial authority over the brotherhood.

Nevertheless, the relation of neighboring churches is most intimate and friendly, and is manifested in various ways; especially by mutual consultations and co-operation, the occasional transfer of members, and formal or informal associations for common work. The principal instrument of Church communion is ecclesiastical councils, whose function is to give counsel and to express fellowship, but never to issue commands. Thus Congregationalism differs from independency in maintaining the fellowship of distinct churches, and from Presbyterianism in denying the right of a presbytery or synod to exercise authority over the churches. It is through this feature of the communion of churches by means of councils that Congregationalism in the U. S. differs from Congregationalism in Great Britain. (See INDEPENDENTS.) In 1891 an International Congregational Council was held in London.

In its principles this system is remarkably unsectarian and liberal, and its development during the last 250 years has been closely identified with increased liberty of religious thought, and with the practical union of men holding different tenets in common works of philanthropy and beneficence.

As a system of church order, Congregationalism is not necessarily connected with any school of theology or any class of doctrine. Its methods of administering church affairs may be adopted alike by Calvinists, Arminians, Socinians, and Arians. The church government of the different denominations of Baptists is, for the most part, simply congregational. Some Methodists have followed the same order. The Churches in the U. S. known as Unitarian are built upon the same platform. This is true also of Christians and Universalists. All these denominations are to be grouped together as occupying common ground in opposition to the idea of a Church comprising many local congregations, and of a government administered by a priesthood. The rise, during the nineteenth century, in Sweden, Holland, and other European countries of organizations of Christians almost identical with the evangelical Congregational churches of English-speaking countries is one of the most interesting facts in the history of Congregationalism.

At the same time, the churches which are generally known as Congregational have held to positive and evangelical views of truth, being Calvinistic rather than Arminian, Trinitarian rather than Socinian or Arian, accepting the doctrine of a future state of endless retribution, recognizing the families of believers as fit subjects of baptism, and regarding the mode of administering baptism as of comparatively small importance. Modifications of theological opinion, however, have appeared from time to time. Each church has its own articles of belief, which with greater or less fullness indicate the system of doctrine taught from the pulpit and accepted by the members. Some churches have taken as their standards the Confession and Catechisms of the divines who met at Westminster, London, in 1648; but the creeds in common use are much briefer. They vary in their phraseology, and are commonly used as formulas for the reception of members.

The Congregationalists of the U. S., when assembled in a national council at Boston in 1865, declared in general terms their "adherence to the faith and order of the apostolic and primitive Churches held by their fathers," but "extended to all believers the hand of Christian fellowship upon the basis of those great fundamental truths in which all Christians should agree." They framed a comprehensive creed, called the "Burial Hill Declaration." So also at Oberlin in 1871 the elders and messengers of the Congregational churches of the U. S., in forming a permanent national organization to meet triennially for discussion thought it sufficient to define their doctrinal position by these words: "They agree in the belief that the Holy Scriptures are the sufficient and only infallible rule of religious faith and practice; their interpretation thereof being in substantial accordance with the

great doctrines of the Christian faith commonly called evangelical, held in our churches from early times, and sufficiently set forth by former general councils." In 1884 a new creed was put forth, prepared by a commission of representative men. These were selected by a committee of seven, appointed by a national council at St. Louis in 1880.

The early home of Congregationalism was New England, to which it was brought at the earliest settlement of the colonies. The Pilgrims who settled Plymouth and the Puritans who settled Massachusetts and Connecticut united in its adoption. As the population has moved westward, this form of Church order has spread extensively through the West and Northwest, till more than half of the churches designated as Congregational are W. of the Hudson river, while in the South and Southwest this denomination until recently was but little known. Recognizing the importance of culture and an educated ministry, the Congregationalists have been distinguished as the founders and liberal supporters of schools, colleges, and theological seminaries. Their theological schools are at Bangor, Me., Andover, Mass., Hartford and New Haven, Conn., Oberlin, O., Chicago, Ill., and Oakland, Cal. The Congregationalists have earnestly co-operated with other denominations in missionary and benevolent organizations which, like the American Bible Society, have invited to united effort. Among the societies which are now chiefly under their direction are the American Board of Commissioners for Foreign Missions, the American Congregational Home Missionary Society, the Congregational Church Building Society, the American Education Society, the American Missionary Association, and the Congregational Sunday School and Publishing Society. These, however, are not strictly ecclesiastical organizations, but associations of individuals over which the churches, as such, have no control. For the control of these agencies some form of confederated union of churches would be requisite. Tendencies in this direction are apparent, but encounter resistance.

Among the Congregationalists of the U. S. there have arisen numerous theological leaders, in earlier and more recent days. The most eminent of them was Jonathan Edwards. Many who have been trained under the influences of Congregationalism have become leaders in other Christian communions, especially in the Presbyterian Church, and many of its clergy have been trained in other communions.

The theory and practice of Congregationalism have been much discussed in the present generation. A valuable repository of essays may be found in the *Congregational Quarterly*, established in Boston in 1859, of which fourteen volumes were published. Other authorities are *Debates and Proceedings of the National Council of Congregational Churches* at Boston, 1865; Dexter's *Congregationalism*: Pond's *Manual*; Bacon's *Congregational Order*; Upham's *Ratio Disciplinæ*; Punchard on *Congregationalism*; Cumming's *Dictionary of Congregational Usages and Principles*; Buck's *Massachusetts Ecclesiastical Law*; *Contributions to the Ecclesiastical History of Connecticut*; and numerous local histories and church manuals.

Statistical summaries of the Congregational churches may be found each year in the *Congregational Year-book*, representing the numerical strength of the denomination and its changes during the preceding statistical year.

The returns thus published in 1900 for the U. S. showed 5,604 churches, 5,614 ministers, and a membership of 629,874, representing 400,249 families. The Sabbath-school enrollment was 682,907 and the number of members received on confession during the year 24,514. In 1862, thirty-eight years before, the aggregate returns showed 2,555 churches, 2,678 ministers, 255,034 members, and 246,178 in Sabbath-schools. For Congregationalism in England, see INDEPENDENTS. For further details, see A. E. Dunning, *Congregationalists in America*; H. M. Dexter, *Congregationalism as Seen in its Literature*; and *The History of Congregationalism*, by Prof. Williston Walker.

E. W. GILMAN. Revised by GEORGE P. FISHER.

Congregation of Rites: See RITES.

Congress [from Lat. *congres'sus*, meeting; deriv. of *con'gredi*, go together; *con*, together + *gra'di*, walk: cf. *gradus*, step]: in international law, a meeting of the sovereigns of states or their representatives for the purpose of arranging international matters. The first general European congress was after the conclusion of the Thirty Years' war in Germany, at Münster and Osnabrück, 1648. Remarkable general congresses have been—of the Pyrenees (1659); at Aix-la-Chapelle (1668); at Nimeguen (1676); at Ryswick (1697); at Utrecht (1713); at Aix-la-Chapelle (1748); at Teschen (1779); at Paris (1782); at Versailles (1785); at The Hague (1790); at Rastadt (1797); at Erfurt (1808); at Vienna (1814, concluded at Paris 1815); at Aix-la-Chapelle (1818); at Troppau (1820); at Laybach (1821); at Verona (1822); at Berlin (1878). More recently the word CONFERENCE (*q. v.*) is commonly applied to international meetings of statesmen for the settlement of international complications. See Phillimore, *On International Law* (ii. 45).

CONGRESS also comes into use as a name for international meetings of scholars of a particular science, as statistical congress, archæological congress, etc.

CONGRESS, the title of the national Legislature of the U. S. of America. It consists of a House of Representatives and of a Senate. The former is composed of members chosen every second year. The qualification of electors is the same as that required in their respective States for electors to the lower house in the State Legislature. The number of representatives is apportioned according to the population of each State, and a new apportionment is made every ten years after the census is taken by authority. The Senate is composed of two members from each State; the Senators are chosen for six years by the Legislature of the State. The House of Representatives chooses its own Speaker; the Vice-President of the U. S. is *ex-officio* president of the Senate. Bills for revenue purposes must originate in the House of Representatives, but are subject to the proposal of amendments by the Senate. The Senate has the sole power of trying impeachments, but it can only convict by a majority of two-thirds of the members present, and its sentence extends only to removal from office and disqualification to hold any office of honor or profit under the U. S. The regular meeting of Congress is on the first Monday in December, annually. Every bill which passes the two houses is sent to the President for approval or disapproval; in the latter case he returns it, with his reasons, to the house in which it originated; if on reconsideration it is passed again by a majority of two-thirds in each house, it becomes law. The powers of Congress are limited, and separated from those of the State Legislatures by the Constitution. Members of Congress can not legally have any interest in any contract with or claim against the Government; they are forbidden to prosecute cases before the court of claims, or to present claims to any of the departments. The Senate consists (in 1901) of 90 members, and the other house of 357 members. The apportionment among the several States is as follows:

Alabama	9	Maine	4	Ohio	21
Arkansas	6	Maryland	6	Oregon	2
California	7	Massachusetts	13	Pennsylvania	30
Colorado	2	Michigan	12	Rhode Island	2
Connecticut	4	Minnesota	7	South Carolina	7
Delaware	1	Mississippi	7	South Dakota	2
Florida	2	Missouri	15	Tennessee	10
Georgia	11	Montana	1	Texas	13
Idaho	1	Nebraska	6	Utah	1
Illinois	22	Nevada	1	Vermont	2
Indiana	13	New Hampshire	2	Virginia	10
Iowa	11	New Jersey	8	Washington	2
Kansas	8	New York	34	West Virginia	4
Kentucky	11	North Carolina	9	Wisconsin	10
Louisiana	6	North Dakota	1	Wyoming	1

No person is eligible to the Senate under the age of thirty years, nor to the House of Representatives under the age of twenty-five. For a full statement of the origin, character, and powers of Congress, see CONSTITUTION OF THE UNITED STATES. Revised by A. T. HADLEY.

Congress of Mothers: See the Appendix.

Congress Spring: a saline mineral spring at Saratoga, N. Y. For analysis, see MINERAL WATERS.

Congressional Term, Limits of: The Constitution of the U. S. provides that members of the House of Representatives in Congress shall be elected every second year. This determines the duration of each succeeding Congress. The Constitution also provides that Congress shall meet at least once a year, and that in the absence of specific legislation on the subject such meeting shall be on the first Monday in December. The time of elections is determined by the individual States; but members of the House of Representatives are commonly elected in November of the even-numbered years, taking their seats in the Congress which begins its existence on Mar. 4 following. As, however (unless a

special session is called by the President), Congress does not meet until the first Monday in December, newly elected members do not take their seats until about fifty-six weeks after their election. The congressional term is divided into two sessions. The first session begins on the first Monday of December of the odd-numbered years and continues until adjournment, ordinarily in August. The second session begins on the first Monday of December in the even-numbered years, and continues till 12 M. of Mar. 4 following. By a law of the Congress elected under the Articles of Confederation, passed Sept. 13, 1788, Wednesday, Mar. 4, 1789, was appointed for the assembling of the first constitutional Congress and the inauguration of the new Government. No quorum, however, was obtained in the House of Representatives on that day, or until Apr. 1 following, and the President was not inaugurated till the 30th of the same month. Subsequently, by an act of the constitutional Congress, passed Mar. 1, 1792, it was declared that "the term of four years for which a President and Vice-President shall be elected, shall in all cases commence on the 4th day of March next succeeding the day on which the votes of the electors shall have been given." At Washington's second inauguration, and at the inauguration of every President since his time, the oath of office has been administered, in each fourth succeeding year, on Mar. 4, at 12 o'clock M.; and until 1851 it was understood that his term of service expired on Mar. 3 at midnight of the fourth year following. The limit of the congressional term was supposed to be the same; so that the legislative powers of each succeeding Congress were presumed to cease at midnight of Mar. 3 of each alternate odd-numbered year. At the close of the Thirty-first Congress, however, in 1851, a discussion arose in which the propriety of this limitation was called in question, and the point was made that, since in the presidential years a new administration is not inaugurated until 12 o'clock on Mar. 4, the interpretation of law commonly received would create an interregnum of twelve hours' duration. In conclusion, Mr. Speaker Howell Cobb, of Georgia, ruled that the term of an outgoing Congress did not expire until 12 o'clock noon of Mar. 4, and that rule has since stood. In conformity with this rule, on Feb. 25, 1853, President Fillmore, in calling a special session of the Senate to organize the administration of his successor, Franklin Pierce, issued a proclamation in the following words: "The attention of the President having been called to the proceedings of Congress at the close of its session on the 4th of Mar., 1851, from which it appears that the constitutional term of that body was held not to have expired until 12 o'clock at noon of that day; and a notice having been issued, agreeably to former usage, to convene the Senate at 11 o'clock A. M. on the 4th of March next, it is apparent that such call is in conflict with the decision aforesaid. Now, therefore, as well for the purpose of removing all doubt as to the legality of such call, as of establishing a precedent of what is deemed a proper mode of convening the Senate, I, Millard Fillmore, President of the United States, do issue this my proclamation," etc. (convening the Senate for Mar. 4 at 12 o'clock noon).

In 1867 a statute was passed declaring the rule specifically as follows: "In addition to the present regular times of the meeting of Congress, there shall be a meeting of the Fortieth Congress of the United States, and of each succeeding Congress thereafter, at 12 o'clock, meridian, on the fourth day of March, the day on which the term begins for which the Congress is elected, except that, when the fourth of March occurs on Sunday, then the meeting shall take place at the same hour on the succeeding day." (Approved Jan. 22, 1867.) This act was repealed Apr. 20, 1871, but as an authoritative declaration of the limits of the congressional term it must be regarded as still of force. A new Congress therefore comes into existence at 12 o'clock at noon on Mar. 4 of each odd-numbered year, and ceases to exist at the same hour of the same day in the second year next following, unless one or the other of those days happens to be Sunday, when Mar. 5 is taken instead of Mar. 4. Under this rule it further appears that the political day throughout the sessions of Congress properly begins, for legislative purposes, at 12 o'clock M. of the calendar day of the same name. This rule was enforced in a manner to attract public attention during the progress of the count of the presidential vote in Feb., 1877, when the Speaker, in the midst of an exciting debate, repeatedly arrested the discussion at 12 M. by announcing the beginning of a new political day, and the chaplain appeared and opened the new session with prayer.

Revised by C. K. Adams.

Congressman at Large: a member elected to the House of Representatives by the voters of the entire State, instead of by those of a district in accordance with the ordinary plan. This mode of election is necessitated by changes in the apportionment after each decennial census. (See Apportionment Bill.) Thus by the act of Feb. 7, 1891, a new apportionment was made of members of that House, the number being fixed at 356. A specific number of members was assigned to each State. It was then provided that in each State entitled under the apportionment to more than one Representative the number to which such State may be entitled in the Fifty-third and each subsequent Congress shall be elected by districts composed of contiguous territory, and containing as nearly as possible an equal number of inhabitants, the number of such districts equaling the number of Representatives to which the State is entitled; but "in case of an increase in the number of Representatives which may be given to any State under this apportionment, such additional Representative or Representatives shall be elected by the State at large, and the other Representatives by the districts now prescribed by law until the Legislature of such State in the manner herein prescribed shall redistrict such State." This apportionment went into effect Mar. 3, 1893.

Con'greve, Richard, M. A: author; b. at Leamington, England, Sept. 4, 1818; educated at Rugby under Dr. Arnold, and at Wadham College, Oxford (B. A. 1840); taught there and at Rugby, finally resigning his tutorship at Wadham when he became a disciple of Comte. He edited *Aristotle's Politics*, with notes (1855; 2d ed. 1874), and published *The Catechism of Positivist Religion* (1858); *Elizabeth of England* (1862); *Essays: Political, Social, and Religious* (1874). D. in Hampstead, July 5, 1899.

Congreve, William: English dramatic poet; b. near Leeds, Feb., 1670. He was educated at the University of Dublin, and entered the Middle Temple as a student of law, but he never devoted much time to its study. His first literary attempt was a novel published under the pseudonym of Cleophil. In 1693 he made a great success with his first play, *The Old Bachelor*, which was performed at Drury Lane. The next year *The Double Dealer*, a better play, was received unfavorably, though it had the warm commendation of Dryden. He produced in 1694 a comedy called *Love for Love*, which added much to his fame and fortune, and in 1697 *The Mourning Bride*, a tragedy, which was greatly admired. He obtained several lucrative civil offices. His comedy called *The Way of the World*, though one of his best plays (1700), failed so completely that he renounced the drama in disgust. He affected to depreciate his dramatic triumphs, and was ambitious to pass for a man of fashion. D. Jan. 19, 1729. See Charles Wilson's *Memoirs of the Life of W. Congreve* (1730).

Co'ni (Ital. *Cuneo*): a town of Italy; in Piedmont; capital of the province of Cuneo; on the river Stura; 54 miles by railway S. by W. from Turin (see map of Italy, ref. 4–B). It has a cathedral, a fine town-hall, a royal college, a theater, several convents, and palaces. It was a strong fortress before 1800, and was dismantled by the French after the battle of Marengo in that year. Here are manufactures of linen and hemp. Coni has an extensive trade. Pop. 24,924.

Conic Sections: in mathematics, the sections of a right cone by a plane. If the cutting plane is perpendicular to the axis, the section is a *circle*; if it is parallel to one side of the cone, the section is a *parabola*; if it makes a greater angle with the base than is made by the side of the cone, the section is a *hyperbola*; if it makes a less angle with the base than the side does, the section is an *ellipse*. The circle, the line, and the point may each be regarded as particular cases of the ellipse; the line as a particular case of the parabola; the triangle as a particular case of the hyperbola. The study of conic sections is specially interesting and important on account of its connections with the laws of moving bodies. The orbits of planets, the paths of projectiles, the undulations of light and sound are all either circular, elliptic, parabolic, or hyperbolic.

Conifers [Lat. *coni'ferae*, fem. plur. of *co'nifer*, cone-bearing; *conus* (= Gr. *κῶνος*), cone + *ferre*, bear]: an order of woody plants (*Coniferæ*, class *Gymnospermæ*), characterized (1) by having hard woody stems consisting of pith, wood, and bark, and which increase in diameter by the growth of layers of wood and bark, the former outside and the latter inside of the older growths; (2) by the development of the seed upon an open bract or scale. In many

cases the seed-bearing bracts or scales are in compact "cones," as in the pines, spruces, firs, etc. Many of the species are evergreen, hence they bear the popular name of Evergreens (*q. v.*).

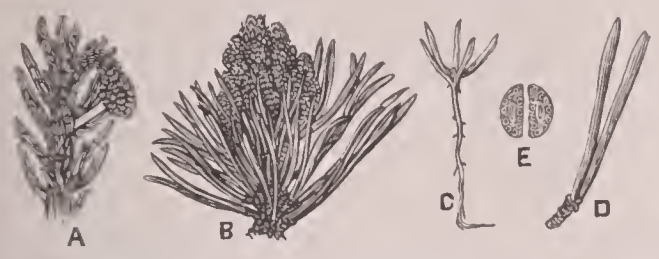


Fig. 1.—Structure of the pine (*Pinus sylvestris*): A, young ovuliferous cone; B, a cluster of polleniferous cones; C, a young plant; D, two leaves; E, sections of two leaves, enlarged.

The conifers constitute a very old order of plants, having originated in Devonian or Subcarboniferous times. At present there are about 350 species, widely distributed throughout the world, representing thirty-four genera, which are often widely separated, through the disappearance of related older forms. The two families are *Taxaceæ* (without cones), and *Pinaceæ* (with cones).

I. The *Taxaceæ* include about ninety species, mostly confined to the south temperate zone and the southeastern Asiatic region. The yew-tree (*Taxus baccata*) of Europe and Asia and the American yew (*T. canadensis*) of Eastern U. S. are good representatives of this family. *Torreya californica*, the California nutmeg-tree, *Gingko biloba*, the gingko-tree of China and Japan, with species of *Phyllocladus* and *Dacrydium* in Tasmania, New Zealand, and Borneo, and *Podocarpus* in Southeast Asia are other representatives, occasionally seen in botanic gardens.

II. The *Pinaceæ* are readily separable into two tribes, *Cupressineæ*, the cypresses (with opposite or whorled leaves and erect seeds), and *Abietineæ*, the firs, pines, etc. (with spirally arranged leaves and mostly inverted seeds).

1. The *Cupressineæ* include the junipers (*Juniperus*, thirty species, all of the north temperate zone); the white cedars (*Thuya*, four species, of which *T. occidentalis* is the common arbor-vitæ of the Eastern U. S., and *Chamæcyparis* of North America and Japan, including *C. sphæroïdea*, the white cedar of Eastern U. S.); the cypresses (*Cupressus*, twelve species of the Mediterranean region, Mexico, and California, including *C. lawsoniana* and *C. macrocarpa*, both fine ornamental trees of California).

2. The *Abietineæ* include the genus *Araucaria* (ten species of large trees of the southern hemisphere); the redwoods (*Sequoia gigantea*, the big-tree, and *S. sempervirens*, the redwood, both of California); the bald cypress (*Taxodium distichum* of the Southern States and Mississippi valley); the firs (*Abies*, eighteen species of the northern hemisphere, including *A. balsamea*, the balsam fir of the Eastern U. S.); the hemlocks (*Tsuga canadensis*, the hemlock of the Eastern U. S., and *Pseudotsuga taxifolia*, the "Douglas spruce" of the Western U. S.); the spruces (*Picea*, twelve species of the northern hemisphere, represented by *P. alba*, the white spruce of Northern and Eastern North America, and *P. engelmanni*, Engelmann's spruce of the Rocky Mountains); the larches (*Larix*, e. g. *L. decidua* of Europe, and *L. pendula*, the "tamarack" of Eastern U. S.); the cedars (*Cedrus* of Europe and Asia, e. g. *C. deodara*, the deodar-cedar of India, and *C. libani*, the cedar of Lebanon of Western Asia); the pines (*Pinus*, of seventy species, widely distributed in the northern hemisphere).

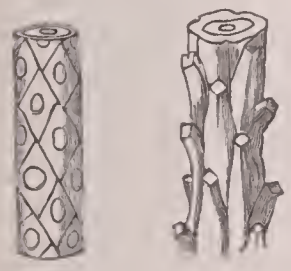


Fig. 2.—A, a twig of a fir (*Abies*), with the leaf-scars on the surface; B, a twig of a spruce (*Picea*), with the leaf-scars elevated.

Charles E. Bessey.

Coniine, kō'ni-in, also called **Conine**, **Conicine**, and **Cicutine**: an alkaloid contained in all parts of the hemlock (*Conium maculatum*). It is extracted most advantageously from the seeds, either by treating with a dilute solution of sodium carbonate and distilling in steam, or by treating the ground seeds in a vacuum with dilute acetic acid, evaporating, adding magnesia, and treating with ether. Coniine is an oil of disagreeable odor, suggestive of mice. It is a violent poison, acting on the motor nerves and producing paralysis. It is an interesting fact that this substance has been prepared artificially by Ladenburg. The artificial product is identical with that found in the hemloek. Coniine is shown to be closely related to piperidine, an alkaloid found in pepper, and piperidine is in turn closely related to pyridine, a substance formed when bones are heated.

Ira Remsen.

Con'ington, John: classical scholar, translator, and writer; b. in Boston, England, Aug. 10, 1825; educated first at Rugby under Dr. Arnold, and then at Oxford, where he became a fellow of University College in 1848. While still a B. A. he published an edition of the *Agamemnon* of Æschylus, with a poetical version, in which he inaugurated the double career, which he successfully followed up, of critical editor and translator. In 1852 he had begun, in conjunction with Mr. Goldwin Smith, an edition of the works of Vergil, the first volume of which was published in 1858. In 1854 he was appointed to the chair of Latin in the university, and from this time to his early death in 1869 his pen was constantly busy. His Æschylean studies were continued in the edition of the *Choëphoræ* in 1857, but after this he felt drawn more particularly to the studies connected with his chair. In 1863 appeared a version of the Odes of Horace, and the second volume of his Vergil. In 1866 he published a spirited translation of the *Æneid* in the ballad measure of Scott, which he followed up the next year by completing the version of the *Iliad* begun by his friend Mr. Worsley. He completed his translation of Horace, and prepared an edition of the *Satires* of Persius, with a translation, just before his death in 1869. The last volume of his edition of Vergil appeared after his death, under the supervision of his friend and fellow-worker, Mr. Nettleship, in 1871. Two volumes of miscellaneous writings, with a memoir prefixed, were issued in 1872, the second volume containing a prose translation of the *Eclogues*, *Georgics*, and *Æneid* of Vergil.

Henry Drisler.

Coniros'tres [from Lat. *conus* (= Gr. κῶνος), cone + *rostrum*, beak]: a group of passerine birds established by Cuvier for the finches, crows, orioles, and others characterized by a stout, conical bill. The term was employed in much the same way by G. R. Gray for the fourth tribe of his order *Passeres*. By later ornithologists the group *Conirostres* was restricted to the finches, tanagers, and weaver birds, and at present the use of the term is practically obsolete.

F. A. Lucas.

Coni'um (in Gr. κώνειον): a genus of plants of which *Conium maculatum* or the poisonous hemlock is the prineipal species. It is an Old World umbelliferous plant naturalized in the U. S. Its leaves are used in medicine as a sedative, hypnotic, and anodyne. In overdoses it produces a dangerons paralysis. With this drug Socrates and Phocion were poisoned. Stimulants and emetics are the best antidotes.

Conjeveram' (anc. *Cauchipura*, or Golden City): a town of Hindustan; on railway; 45 miles S. W. of Madras, in the presidency of Madras (see map of South India, ref. 6–F). It consists mostly of mud cabins, extends over considerable ground, and contains large gardens and cocoa-groves. It is noted for two interesting pagodas with very fine sculptures. Pop. (1891) 42,548.

Conjugation [from Lat. *conjugatio*, a yoking together (*con* + *jugum*, yoke); in the technical language of grammar a translation of Gr. συζυγία (ef. *syzygy*); σύν, together + ζυγόν, yoke]: in grammar, a regular distribution of the several inflections of verbs into their different voices, moods, tenses, numbers, and persons; a synopsis or statement of the changes of form or inflections to which a verb is subject. In Latin grammar there are four different forms of regular verbs, which are called the first, second, third, and fourth conjugations, and in some languages the number is even greater. See Grammar.

Conjugation is also a process occurring among the lower forms of organic life, in which the substance of two distinct organisms, coming into contact, is passed into a single mass. In plants it is always attended with reproduction, sometimes also in animals. It has been observed in numerous algæ and in some fungi.

Conjunction [from Lat. *conjunc'tio*, joining together; *con*, together + *jun'gere*, join]: the aspect of a planet when it is in or near the same straight line with the earth and the sun. When between the earth and the sun, it is said to be inferior; if beyond the sun so that the latter is the central body of the three, or if outside the earth so that the latter is the central body, the conjunction is called superior. Ow-

ing to the inclination of the planes of the several orbits, the three bodies are never mathematically in the same straight line. The conjunction is said to be in longitude or in right ascension, according as the planet and the sun have the same right ascension and the same longitude, or have right ascensions and longitudes differing by 180 degrees. S. N.

Conjunction: in grammar, a part of speech used to connect words with words or sentences with sentences. It may serve to express the relation of propositions to each other. Conjunctions are co-ordinate when they unite expressions of logically equal importance: subordinate when they unite a dependent clause to a principal one. They are called copulative when they imply an addition, as *and*; alternative when they imply a choice, as *or*; adversative, implying an opposition, divergence, or check, as *but*; concessive, implying like the adversative an opposition, but unlike them introducing the opposed rather than the opposing, as *though*: hypothetical, implying supposition, as *if*; causal, implying reason, as *because*; final, implying purpose, as *that*; consecutive, implying effect, as (*so*) *that*; temporal, implying time, as *when*. Historically they are the result of differentiation out of adverbs or pronouns through displacement in their interpretation. Revised by BENJ. IDE WHEELER.

Conjunctiva: See EYE.

Conkling, ROSCOE, LL. D.: statesman: b. at Albany, N. Y., Oct. 30, 1829; studied and practiced law. In 1846 he removed to Utica, of which place he became mayor in 1858; was elected to represent his district in the U. S. Congress four times, and in 1867, 1873, and 1879 to the U. S. Senate. Throughout the war he was the staunch supporter of the administration, figuring prominently from the first in debates and on committees. As Senator he took an active part in the reconstruction of the Southern States, opposed President Johnson's policy, and zealously championed Grant's administration, even advocating his nomination for a third term in 1880. Resigned May 16, 1881, in consequence of President Garfield's assumption of the control over appointments in New York State and the Senate's confirmation of the President's policy; confirmed as associate justice of Supreme Court of U. S. Mar. 2, 1882, but declined the office. D. in New York city, Apr. 18, 1888. See *Life and Letters* (1889).

Conlie: a French village; in the department of Sarthe; 14 miles W. of Le Mans (see map of France, ref. 4–D). Near it the French Government established in Oct., 1870, a large fortified camp. After the battle of Le Mans the camp was, on Jan. 14, 1871, occupied by the Germans.

Con'naught: the most western province of Ireland; bounded N. and W. by the Atlantic Ocean, E. by Ulster and Leinster, and S. by Munster. Area, 6,863 sq. miles. It is divided into the counties of Galway, Leitrim, Mayo, Roscommon, and Sligo. The surface in the western part is mountainous. The coast is deeply indented and affords good harbors. The river Shannon forms the eastern boundary of the province. Connaught was formerly a kingdom of the Irish pentarchy. Pop. (1881) 821,657; (1891) 723,573.

Connaught, ARTHUR WILLIAM PATRICK ALBERT, Duke of: Prince of the United Kingdom, Duke of Saxony, Prince of Coburg and Gotha; b. at Buckingham Palace, May 1, 1850; the third son of Queen Victoria. Entered the Military Academy at Woolwich in 1866; was rapidly promoted, becoming general of brigade in 1880; was created Duke of Connaught and Strathearn and Earl of Sussex, May 26, 1874, taking his seat in the House of Lords June 8. On Mar. 13, 1879, he married Princess Louise Margaret of Prussia, the grand-niece of Emperor William I. of Germany.
C. H. THURBER.

Conneaut, kon'nĕe-awt: village; Ashtabula co., O. (for location of county, see map of Ohio, ref. 1–J); on Lake Sh. and Mich., So. and N. Y., Ch. and St. L. R. Rs., and on Conneaut creek; 68 miles E. N. E. of Cleveland; has a good harbor at the mouth of Conneaut creek, 2 miles from the village, which is the Lake Erie terminus of the Pittsb., Shen. and L. E. R. R., and is a large coal-shipping and ore-receiving port. The village has five churches, fine public schools, large railroad shops, sundry manufactories, water-works, electric lights, and is a shipping-point for produce. The first settlers of the Western Reserve landed here in 1796. Pop. (1880) 1,256; (1890) 3,241; (1900) 7,133.
EDITOR OF "REPORTER."

Connecticut, kon-net'i-kŭt: a river of the U. S.; rises in the extreme northern part of New Hampshire, near the frontier of Canada. Its west bank forms the entire boundary between New Hampshire and Vermont. (See NEW HAMPSHIRE.) It flows in a general S. S. W. direction until it enters Franklin co., Mass. It afterward intersects Massachusetts and Connecticut, flowing nearly southward to Middletown, Conn., below which its course is S. E., and enters Long Island Sound at Saybrook. Length about 450 miles. The valley of the Connecticut is celebrated for the beauty of its scenery, the fertility of its soil, and the luxuriant growth of the tobacco-plant known as the Connecticut seed-leaf, which is used principally as wrappers in making cigars. It is not an uncommon thing for the crop to exceed 2,000 lb. to the acre. The head of steamboat navigation is at Hartford, which is about 50 miles from its mouth. Its principal affluents are the Deerfield, Farmington, and Chicopee rivers.

Connecticut: one of the New England States; situated between 41° and 42° 3′ N. lat. and 71° 55′ and 73° 50′ W. lon.; bounded N. by Massachusetts, E. by Rhode Island, S. by Long Island Sound, W. by New York. Area, 4,990 sq. miles; coast-line, 100 miles; length, E. to W., 86 miles; average breadth, N. to S., 55 miles.

Connecticut seal.

Connecticut, by the census of 1900, ranked twenty-ninth among the States in population.

Topography, Rivers, etc.—There are no elevations deserving the name of mountains in the State. Numerous ranges of hills; in the east rounded and fertile, in the west often broken and precipitous, with bold bluffs of trap-rock. Three principal rivers, with their affluents and some smaller ones, drain the State—viz., the Connecticut, Thames, and Housatonic. The river-valleys are generally very fertile, but the Sound shore is sandy. The hills furnish good grazing lands. The Connecticut, Housatonic, and Thames are navigable to the head of tide-water. The numerous falls on the smaller streams afford abundant water-power. There are no lakes, but there are many ponds in the State.

Minerals.—Copper and lead, both combined with silver, are found in considerable quantities, but have not been worked profitably hitherto; bog-iron ores, hematite in the northwest yielding excellent iron, and nickel; limestone for lime, marble, and the brownstone (old red sandstone) of the Portland quarries; flagstones, granite, and gneiss; sulphate of barytes, hydraulic lime, verd-antique, tiling slate, fire-clay and kaolin, and many mineral springs.

Vegetation and Vegetable Products.—There is yet considerable timber in Connecticut, including hickory, white, red, and yellow oak, chestnut, butternut, tulip-tree, beech, birch, hop-hornbeam, four species of maple, ash, elm, wild cherry, sassafras, and many shrubs and small trees. The soil is good in the valleys, and with judicious cultivation yields liberal crops. Tobacco is the largest crop in the Connecticut valley, and Indian corn, oats, rye, and buckwheat are largely grown, with some wheat and barley; potatoes and hay are large crops; orchard fruits are plentiful. The west and southwest parts of the State produce large quantities of market vegetables and small fruits for the New York market. Dairy, cattle, and sheep farming are favorite pursuits, and the milk, butter, and cheese of Western Connecticut are famous. The returns for 1900 show the following products in Connecticut: Indian corn, 1,771,180 bush.; oats, 578,987 bush.; rye, 239,802 bush.; buckwheat, 60,304 bush.; wheat, 6,864 bush. In 1900 2,478,528 bush. of potatoes and 427,411 tons of hay were produced; in 1896 the pounds of tobacco raised were 10,197,450.

Animals.—There are few wild animals except the smaller game. There were in 1899 in Connecticut 44,119 horses, 210,717 cattle, and 31,808 sheep.

CONNECTICUT

B C 73°30' D E F 73° G H J K 72° L M

Scale of Miles 0 1 2 3 4 5 10 15

County Towns ⊙

Longitude West from Greenwich

The *climate* is not so harsh in winter as that of the States bordering on the ocean, the extreme range of the thermometer for the year not exceeding 90° F.; maximum 93°, minimum 3°; summer mean about 68° or 69°, and winter mean from 27° to 29°; mean annual rainfall, from 51 to 52·5 inches. The State is generally healthy, pulmonary complaints being somewhat prevalent, and zymotic diseases occurring in the river-valleys. Miasmatic fevers, formerly unknown, now prevail in most parts, but are not severe.

Manufactures.—Connecticut is essentially a manufacturing State, and excels any other in the variety of its industries, while the amount of manufactured products is large for its population. All descriptions of textiles; wares of gold, silver, brass, copper, zinc, nickel, iron, steel, leather, wood, etc.; clothing, clocks, watches, carriages, books and printing, firearms and ammunition, sewing-machines and other machinery, flour and food preparations, glass and lamps, hats, hooks and eyes, hoop-skirts and hosiery, jewelry, musical instruments, needles and pins, paper and perfumery, spectacles, straw goods, varnish, veneering, vinegar, and whips are a few of the varied productions of its factories. The census returns of 1890 showed that 6,822 manufacturing establishments reported. These had a combined capital of $227,004,496; employed 149,939 persons; paid $75,990,606 for wages and $123,183,080 for materials; and had products valued at $248,336,364. The combined textile industries employed 198 establishments, with invested capital of $59,262,994; hands employed, 31,539; wages paid, $11,472,070; value of products, $46,042,392. In wool manufacture, 109 establishments were employed with total capital of $25,090,116; value of products, $20,843,965. There were 35 establishments engaged in silk manufacture, with aggregate capital of $9,037,042; value of finished products, $69,154,599. In 1899 10,129 tons of pig iron were produced, and (with Massachusetts) 29,611 tons of iron ore were mined.

Finances.—The State debt, Sept. 30, 1900, was $2,108,873.29. The assessed valuation is about $500,000,000. State receipts for the year ended Sept. 30, 1900, $2,876,856.83; expenditures for the same year, $2,528,514.13.

Commerce.—The direct foreign commerce from the ports of Connecticut for the year ending June 30, 1900, aggregated $1,820,084. The commerce of Connecticut through the port of New York was very large, the business of Connecticut covering an immense import and export trade, but figures are not separately given. The internal commerce and coasting trade are also very large. In 1892 the registered, enrolled, and licensed vessels in Connecticut were 825, of 140,684 tons; of these, 186 were steam craft, of 47,937 tons. In foreign commerce, 86 vessels, of 17,263 tons, entered in year ending June 30, 1894.

Banks, etc.—Number of national banks in operation in Connecticut Sept. 5, 1900, 84; capital, $20,635,050; circulation, $9,833,529.50; deposits, $42,911,891.41; 8 State banks and 14 trust companies with $4,015,000 capital and $15,685,935 deposits, and 88 savings-banks with $174,135,195 deposits. There are 25 fire and marine insurance companies —8 joint-stock, 17 mutual; the assets about $36,000,000; also 12 life and 2 accident insurance companies; aggregate assets, nearly $140,000,000.

Education, Libraries, etc.—Connecticut had in 1899 a school population of 194,817, of whom 151,325 are enrolled in public schools, with an average attendance of 109,951. There were also 77 public kindergartens with 6,895 pupils. Number of school-houses, 1,620. Schools were taught an average of nine months in each year. There were 771 school libraries, toward which the State has contributed $113,105, and districts and individuals $244,061, since 1875. There were 4,085 teachers—men, 372; women, 3,713; average monthly pay of men, $89.87; of women, $43.61; income and expenditure for public schools, about $3,000,000. There are high schools in all the larger towns, 4 normal schools with 1,053 pupils, and 7 teachers' institutes. There are many collegiate schools and seminaries for both sexes, 3 universities or colleges, all well endowed, and 1 (Yale University at New Haven) having schools of law, medicine, theology, physical science, engineering, music, agriculture, and philosophy; Trinity College, and Wesleyan University. The 3 colleges had 2,970 students in 1900. There are in the State more than 100 public libraries of more than 300 volumes each, with an aggregate of about 750,000 volumes. In 1900 the whole number of newspapers published in the State was 45 daily, 113 weekly, and 36 others.

Churches.—There are about 1,200 churches of all denominations, and over $17,000,000 of church property. The Congregationalists are the leading denomination, followed in their order by the Methodists, Episcopalians, Baptists, Roman Catholics, Universalists, Presbyterians, Lutherans, Jews, etc.

Population.—Constant emigration has prevented a very rapid growth in Connecticut. In 1790 the population was 237,946; in 1850, 370,792; in 1870, 537,454; in 1880, 622,700; in 1890, 746,258 (white, 733,438; colored, 12,820; besides 129 Asiatics and 24 Indians); in 1900, 908,355. The principal towns are Hartford (capital), 79,850; New Haven, 108,027; Bridgeport, 70,996; Waterbury, 45,859; New Britain, 25,998; Meriden, 24,296; New London, 17,548; Norwich, 17,251; Danbury, 16,537; Stamford, 15,997; Ansonia, 12,681; Naugatuck, 10,541; Middletown, 9,589; Willimantic, 8,937; Torrington, 8,360; Derby, 7,930; Rockville, 7,287; Winsted, 6,804.

COUNTIES.	* Ref.	Pop. 1890.	Pop. 1900.	COUNTY-TOWNS.	Pop. 1900.
Fairfield	11-D	150,081	184,203	Bridgeport	70,996
				Danbury	16,537
Hartford	8-G	147,180	195,415	Hartford	79,850
Litchfield	8-E	53,542	63,672	Litchfield	3,214
Middlesex	11-H	39,524	41,760	Haddam	2,015
				Middletown	17,486
New Haven	11-F	209,058	269,163	New Haven	108,027
New London	10-K	76,634	82,758	New London	17,548
				Norwich	24,637
Tolland	8-J	25,081	24,523	Tolland	1,036
Windham	8-K	45,158	46,861	Brooklyn	2,358
Totals		746,258	908,355		

* Reference for location of counties, see map of Connecticut.

History.—The territory now embraced in the State of Connecticut, as well as the eastern part of Long Island, was first explored by the Dutch from the neighboring colony of New Netherlands, who laid claim to it, before 1620, but made no settlement within its limits till 1633. First white settlement, June 8, 1633, by Dutch, at Dutch Point, Hartford; second, also 1633, by a party from Plymouth colony, at mouth of Tunxis (Windsor); third, Wethersfield, 1634, autumn; fourth and fifth at Saybrook, 1635, and additions to Windsor and Wethersfield; sixth, Hartford, 1636; the last three united in 1637, and in May of that year, under Capt. Mason, attacked and destroyed Pequot fort near New London. In 1638 Quinnipiac (afterward New Haven) settled by Davenport, Eaton, etc.; with adjacent towns remained a separate colony till 1665, when, after earnest resistance, it united with the river-towns known as Connecticut under charter of Charles II., granted in 1662 to John Winthrop (second). In 1685–87 James II. attempted to annul all the New England charters and put the colonies together under a royal governor—Sir Edmund Andros—appointed by the crown. The demand was made on Connecticut in Oct., 1687, but after some debate the lights were extinguished and the charter secretly conveyed away and hidden in the hollow of a large oak on the Wyllys estate, ever after known as the CHARTER OAK (*q. v.*). Sir Edmund Andros took possession of the government, and for a year and a half ruled tyrannically, but was deposed on the fall of James II., and the charter of 1662 continued to be recognized as the supreme law of the colony for 129 years thereafter. The general court or colonial legislature held two sessions a year, and from 1701 to 1875 these and the annual sessions which succeeded them were held alternately in Hartford and New Haven. Hartford is now the sole capital. During the first and second French wars the colony of Connecticut furnished her full quotas promptly, and in the Revolution she furnished more men and more money in proportion to her population than any other colony. Her Governor (Jonathan Trumbull) was Washington's wisest counselor, and her general assembly were among the earliest petitioners for the Declaration of Independence. Connecticut was the fifth State to adopt the Constitution of the U. S., Jan. 9, 1788. Connecticut suffered severely from the events which preceded the war of 1812, but furnished her full quota of men and means for the war. The so-called "Hartford Convention" of Dec., 1814, composed of delegates from all the New England States, was not, as is often alleged, an unpatriotic or treasonable body, but its action was rendered unnecessary by the speedy conclusion of the war. In 1818 Connecticut adopted her present constitution, which abolished all relics of slavery and of a State Church. It has been modified since then, but never abrogated. The State took part in the

Mexican war, and early dedicated its Western lands in Ohio to an educational fund for all its children. Since 1818 the State has been generally prosperous and peaceful. She took an active part in the war of 1861–65, and sent her full quota of men into the field as thoroughly equipped and supplied with all that was needful to their efficiency as those of any State in the Union. Her soldiers were distinguished on all the battle-fields of the war, and her war Governor, Buckingham, was one of President Lincoln's most trusted counselors. Politically, the State is very equally balanced between the Democratic and Republican parties. The arms of the State are three vines in fruit, two and one, all proper. The motto is *Qui transtulit sustinet*—He who transplanted sustains.

GOVERNORS.

Samuel Huntington	1785–96	Alexander H. Holley	1857–58
Oliver Wolcott	1796–98	William A. Buckingham	1858–66
Jonathan Trumbull	1798–1809	Joseph R. Hawley	1866–67
John Treadwell	1809–11	James E. English	1867–69
Roger Griswold	1811–13	Marshall Jewell	1869–70
John Cotton Smith	1813–18	James E. English	1870–71
Oliver Wolcott	1818–27	Marshall Jewell	1871–73
Gideon Tomlinson	1827–31	Charles R. Ingersoll	1873–77
John S. Peters	1831–33	Richard D. Hubbard	1877–79
Henry W. Edwards	1833–34	Charles B. Andrews	1879–81
Samuel A. Foote	1834–35	Hobart B. Bigelow	1881–83
Henry W. Edwards	1835–38	Thomas M. Waller	1883–85
William W. Ellsworth	1838–42	Henry B. Harrison	1885–87
Chauncey F. Cleveland	1842–44	P. C. Lounsbury	1887–89
Roger S. Baldwin	1844–46	Morgan G. Bulkeley	1889–93
Isaac Toucey	1846–47	Luzon B. Morris	1893–95
Clark Bissell	1847–49	O. Vincent Coffin	1895–97
Joseph Trumbull	1849–50	Lorrin A. Cooke	1897–99
Thomas H. Seymour	1850–53	George E. Lounsbury	1899–1900
C. H. Pond (acting)	1853–54	George P. McLean	1901–
Henry Dutton	1854–55		
William T. Minor	1855–57		

Revised by A. R. SPOFFORD.

Connection of Ideas: See ASSOCIATION OF IDEAS.

Con'nellsville: borough and railroad junction; Fayette co., Pa. (for location of county, see map of Pennsylvania, ref. 6–B); on the Youghiogheny river: 57 miles S. S. E. of Pittsburg; has first-class graded schools, churches of seven denominations, Armory Hall, and a State hospital; has electric lights, gas, natural gas, water-works, paved streets, and electric cars. It is the center of the famous Connellsville coke region, which stretches away for 20 miles N. and S. and embraces 84 mines and coke-works, the latter aggregating 18,000 ovens, and the whole employing upward of 20,000 men. Connellsville is an historic point, having been settled in 1767 by Washington's friend, Col. William Crawford, who was burned at the stake by the Indians at Sandusky, O., in 1782. Pop. (1880) 3,609; (1890) 5,629; (1900) 7,160. EDITOR OF "COURIER."

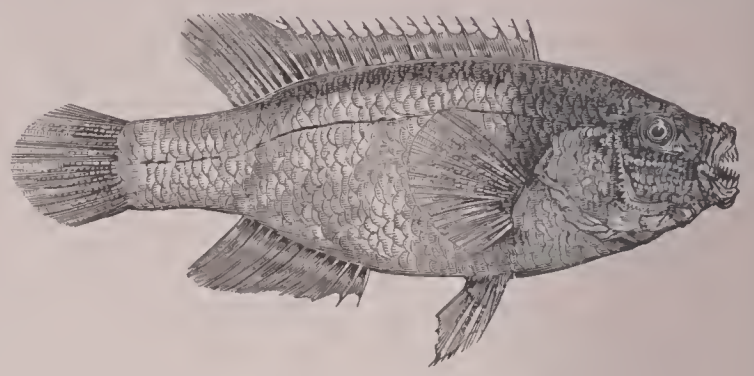
Connema'ra: a district forming the western part of County Galway, Ireland; about 30 miles long and 20 miles broad; noted for its wild and picturesque scenery. Its lakes and inlets abound in fish, and it is much visited by tourists.

Conner, DAVID: naval officer; b. in Harrisburg, Pa., in 1792; entered the U. S. navy as midshipman in 1809; served with great honor in the war of 1812–15; as commodore in the Mexican war, effectively blockaded the Mexican ports on the Gulf; became commandant of the Philadelphia navy-yard. D. in Philadelphia, Mar. 20, 1856.

Conner, JAMES: b. at Charleston, S. C., Sept. 1, 1829; graduated at South Carolina College in 1849, and was admitted to the bar in 1852. In 1856 he was appointed U. S. district attorney for South Carolina; resigned that office Dec., 1860. He was appointed Confederate States district attorney for South Carolina, but did not actively assume the duties of the office; entered the Confederate army in 1861 as captain, and became acting major-general; was engaged in many battles, and after the war again practiced law. In 1876 he was made chairman of the State Democratic executive committee, and was elected attorney-general on the ticket with Hampton for Governor; resigned in 1877. D. June 26, 1883.

Connersville: city; capital of Fayette co., Ind. (for location of county, see map of Indiana, ref. 7–G); on Cin., Cl., Ch. and St. L., Cin., Ham. and Dayton, and Ft. Wayne, Cin. and L. R. Rs., and on the Whitewater river; 67 miles N. W. of Cincinnati. The chief industries of the city are manufactures of furniture, carriages, and blowers. It has water-works, electric lights, and natural-gas wells. Pop. (1880) 3,228; (1890) 4,548; (1900) 6,836. EDITOR OF "NEWS."

Connor, or **Cunner**: a small European marine fish (called also *gilt-head* and *golden maid*), the *Crenilabrus melops*. A somewhat similar fish is the connor, blue perch, chogset, or bergall of the Atlantic waters of the U. S. (*Ctenolabrus*



The connor, or gilt-head.

adspersus). It is a tolerable fish for the table, for which it is extensively caught.

Connor, SELDEN: b. Jan. 25, 1839, at Fairfield, Me.; graduated at Tufts College, Medford, Mass., in 1859; studied law, but before commencing the practice of it he enlisted as a private in a Vermont regiment at the commencement of the civil war; became afterward a lieutenant-colonel in a Maine regiment; received a commission as colonel, and was severely wounded in the battle of the Wilderness in 1864; he then became a brigadier-general; was mustered out Apr., 1866, was appointed an assessor of internal revenue in 1868, a collector of internal revenue in 1873, and was Governor of Maine from Jan., 1876, to Jan., 1879, and U. S. pension agent from 1882 to 1886.

Co'noid [from Gr. κωνοειδής, cone-like; κῶνος, cone + εἶδος, appearance]: a skew surface, generated by the motion of a line which remains parallel to a plane, and has a rectilinear director. When the directing plane and line are perpendicular to each other, the latter is a line of striction on the surface. This line being taken as axis of z, the equation of the surface may be written $z = f\left(\frac{y}{x}\right)$, whatever the nature of its second director may be. Should the latter be also a right line, not in the same plane with the first director, the conoid will be an equilateral paraboloid. The cono-cuneus of Wallis is also a conoid; and another example is the skew helicoid, the curvilinear director of which is a helix, having the rectilinear director for its axis. The under surface of a spiral staircase presents a familiar illustration of this conoid. A conoid may be regarded as having three directors—one curvilinear and two rectilinear; one of the latter being at infinity. If the first of these directors be a curve of the mth order, then the order of the conoidal surface will be $2m$, and each rectilinear director will be a multiple curve on the conoid of the mth order of multiplicity. The directing plane being horizontal, the lines of level on the surface will be the generators; the lines of greatest slope, since they cut the former lines perpendicularly, will be projected into circles on the directing plane. Formerly it was a custom to give the name *conoid* to any solid generated by the rotation of a conic section around one of its axes. In this acceptation the term is obsolete, and has been replaced by that of a *quadric of revolution*.

Co'non, or **Ko'non** (in Gr. Κόνων): an Athenian general of high reputation; entered public life about 413 B. C. He was one of the ten generals chosen in 407, and was defeated by Lysander at Ægospotami in 405. He commanded the combined fleets of Persia and Athens which defeated the Spartans at Cnidos in 394 B. C. He afterward rebuilt the Long Walls of Athens. His son Timotheus was an eminent commander.

Conon of Samos: Greek geometer and astronomer; was a friend of Archimedes, who expressed in one of his works a high estimation of his sagacity. He lived at Alexandria about 250 B. C. Conon invented the curve called the spiral of Archimedes. His works are all lost.

Conquest: See INTERNATIONAL LAW.

Con'rad I.: Emperor of Germany; elected in 911 A. D. He was previously Duke of Franconia, and related to the Carlovingian house. He waged war against Henry the Fowler, of Saxony, from whom he conquered Thuringia; Charles the Simple, of France, from whom he conquered Alsace and Lorraine; and Arnulf of Bavaria, whom he

drove into Hungary. He fell in a battle against the Magyars Dec. 23, 918.

Conrad II. (called *The Salic*): son of Henry, Duke of Franconia. He was elected King of Germany in 1024, and was crowned as emperor by the pope in 1027. He is said to have been the author of the written feudal law of Germany. D. June 4, 1039, and was succeeded by his son Henry III.

Conrad III., of Germany: b. in 1093; was the first of the Hohenstaufens and a grandson of Henry IV. He was elected emperor in 1138, and waged war against Henry the Proud, Duke of Saxony. The party names of Guelph and Ghibelline originated in this war. In 1147 he led a crusade. Excited by St. Bernard of Clairveaux, he took the cross and hastened to Asia Minor at the head of a splendid armament, but his plans were foiled by the treachery of Manuel Comnenus. He besieged Damascus without success, and returned in 1149. D. Feb. 15, 1152, and was succeeded by Frederick Barbarossa. See Gundling, *Geschichte und Thaten Kayser Conrads III.*, 1720.

Conrad IV.: son of Frederick II., Emperor of Germany; was born in Apulia in 1228. He was crowned King of the Romans in 1237, and on the death of his father in 1250 assumed the title of emperor. He was supported by the Ghibellines, but the pope and the Guelphs recognized his competitor, William of Holland. Conrad marched into Italy in 1251, and took Naples. D. May 27, 1254.

Conrad V., or **Con'radin**: the son and heir of Conrad IV.; was born in 1252. The kingdom of Naples was usurped by his uncle Manfred. Instigated by the pope, Charles of Anjou waged war against Manfred and conquered Naples. Conrad was captured at Tagliacozzo in 1268 by Charles, by whose order he was beheaded.

Con'salvi, Ercole, Cardinal: an Italian statesman and reformer; b. in Rome, June 8, 1757. He became, in 1800, chief minister of Pope Pius VII., and negotiated the concordat with Bonaparte in 1801. He promoted art and learning, and was an able diplomatist. D. Jan. 24, 1824. See Crétineau-Joly, *Mémoires du Cardinal Consalvi.*

Consanguin'ity [from Lat. *consanguin'uitas*, blood-relationship; *con*, together + *sanguis*, blood]: in law, relationship by blood, or that subsisting between persons descending from a common ancestor, or where one descends from the other—distinguished from Affinity (*q. v.*). It is either lineal or collateral. It is said to be lineal when one of the persons whose relationship is to be traced is descended from the other. It is said to be collateral when they are descended from a common ancestor, and one is not descended from the other. There are two principal modes of reckoning collateral consanguinity. One method is to count the degrees intervening between the one farthest removed from the common ancestor and such ancestor. Thus the son of the nephew of A on that system of computation is related to A in the third degree, as being three removes from the common ancestor, the father of A. This is the method of the canon and common law. The civil law reckons the degrees from the one relative to the other, ascending, on the one hand, from one of the parties to the common ancestor, and then counting downward to the other. On that theory A would be related to the son of his nephew in the fourth degree. The civil-law method is generally employed in the U. S. In reckoning lineal consanguinity the two systems do not differ. Thus the father and son are related in the first degree, the grandfather and grandson in the second. It frequently becomes necessary to resort to these rules not only in considering the transmission of estates, but in ascertaining persons who are disqualified to act as judges or jurymen by reason of relationship.

Conscience [from Lat. *conscien'tia*, the sharing of knowledge with another, common understanding, knowledge with one's self, moral consciousness, conscience; *con*, with + *scire*, know]: the sense of right and wrong. There are two great questions concerning what we call conscience:

I. The psychological theory of conscience turns upon the question of what the mind is concerned with when it has the sense of "ought" or "ought not." There are certain great theories which have been maintained in the history of psychology and philosophy. First, the intuitional theory, which claims that man has an inborn and absolutely perfect knowledge of the moral relations of actions, and only has to recognize the moral quality when he sees it. This theory is combated by the second great theory, which recognizes the gradual growth in the mind of the moral sense from incomplete beginnings up to the more adequate judgments which the adult possesses. This theory takes on several forms. The intuitionists, in view of the child's evident growth as a moral being, have divided into two camps, one of which still holds to the view that conscience is a perfect faculty, and can not grow or be educated, and the other admits that conscience grows more perfect as the child and race grow up, but says that it is always correct, even in the child, as far as it goes. To these latter, conscience is not based upon experience, but nevertheless profits by experience in its growth. In the camp of the opponents to intuitionism we have two great schools: the naturalists, who hold that conscience, like all the other mental functions, is a product of evolution; that it has arisen in the development of the race on account of its social utility, and that each individual gets his conscience gradually by growing up into the system of social relationships which represent law and order to him. The naturalistic theory does not necessarily deny final authority to conscience, but only says that whatever its authority it is, in its origin, not inborn, but a thing developed both by the race and by the individual. The other great theory is the idealistic, which holds generally to the opinion that conscience is capable of education and growth, but goes on to find in it the final statements of the real value-system of the world and the foundation of philosophy.

II. On the metaphysical side there are, again, three great classes of solutions. The materialists say that the naturalists are right, that conscience is an outcome of evolution; and since to them evolution is a process from material beginnings, the outcome is also relative, and conscience, like all the mental faculties, is a function of brain action. The intuitionists say that conscience, being inborn, was implanted once for all, and supports the metaphysics of spiritualistic theism. The idealists hold that in all evolution there is the working out of an absolute principle which fully reveals itself, though gradually yet most completely, in the moral sense, both in the race and in the individual.

As to this last point, the authority or so-called "imperative" of conscience, none of the theories deny it, as a matter of fact. J. Mark Baldwin.

Conscience, kōn'si-ăns', Henri: b. at Antwerp, Dec. 3, 1812. From 1830 to 1836 he served in the Belgian army as simple soldier, but made his name known throughout the whole country by his patriotic songs, to which he often set the tune himself. Nevertheless, from 1836 to 1838 he had to fight hard to make a living as a journeyman gardener, a village schoolmaster, etc., but in 1838 he began to write for the Anti-French League, an association working for the expulsion of the French language from Belgium and the adoption of the Flemish. Although he wrote all his novels in Flemish (*The Lion of Flanders, Jacob van Artevelde, Valentyn, The Lost Glove*, etc.), he soon became one of the most widely read novelists of the day. His books were translated into German, French, English, Danish, etc. The King of Belgium made him teacher of Flemish to his children, and the city of Antwerp erected a statue in his honor before his death. D. in Brussels, Sept. 10, 1883.

Consciousness: See the Appendix.

Conscript Fathers [Lat. *patres conscrip'ti*, those enrolled as fathers, i. e. in the senate]: an appellation given to the senators of ancient Rome, because, after the expulsion of Tarquin, when Brutus added another hundred to the number of senators, the names of the new members were "written together" with those of the old, and the whole body received the appellation of Conscript Fathers.

Conscription [Lat. *conscrip'tio*, a putting together in writing, description in writing, a writing; *con*, together + *scri'bere*, write. The word was first employed in the sense "a compulsory enlistment" by the French republic in 1798]: a compulsory enrollment of men for military service. This is the system by which the armies of France and some other countries are recruited. The soldiers who are thus compelled to enter the army are called conscripts. The conscription was established in France during the Revolution of 1789. The number required for the service is drawn by lot from the number of young, able-bodied men who are not exempt.

Consecration [from Lat. *consecra'tio*, deriv. of *consecra're*, make sacred, dedicate; *con* + *sacra're*, deriv. of *sa'cer*, holy]: 1. The act or ceremony of separating a person or a thing from a common to a sacred use. 2. The act by which

a priest, duly and canonically chosen to "the office and administration of a bishop in the Church of God," receives the grace of the episcopate by the imposition of the hands of three bishops. 3. The act of the priest by which, at the celebration of the Eucharist, by the recital of the words of institution and the use of the appointed manual acts, through the operation of the Holy Ghost, the offered bread and wine are sacramentally made the body and blood of Christ. 4. The act of a bishop or priest when setting apart for holy uses a church, an altar, the sacred vessels, vestments, etc. "The Form of Ordaining or *Consecrating* a Bishop" is a part of the ordinal appended to the English and American Prayer-books. The form of service generally, though not necessarily, used in consecrating churches in England was drawn up by both Houses of Convocation in 1712, but failed to receive the royal assent. "The Form of Consecration of a Church or Chapel" set forth by the authority of the General Convocation of 1799 is, with slight changes adopted in 1886, one of the offices of the American Church, and is found in the new Standard of 1892.

W. S. PERRY.

Consecrator: in the Holy Communion, the bishop or priest who celebrates. The officiant in the act of setting apart a church or its furniture for sacred uses. In conferring the episcopate, the archbishop or metropolitan or the bishop presiding at the function. In the Protestant Episcopal Church, the senior bishop at a consecration, or the bishop to whom the commission of the presiding bishop is addressed authorizing him with two other "consecrators" to admit a bishop-elect to the episcopate by the laying on of hands and by prayer.

W. S. PERRY.

Consen'tius: a Latin grammarian of the fifth century A. D., from Gaul. His two works, *On the Noun and Verb* and *On Barbarisms and Metaplasms*, are printed in Keil's edition of the *Grammatici Latini*, vol. v., pp. 329–404.

Conservation of Force: See ENERGY; also DISSIPATION OF ENERGY.

Conservatives [from Fr. *conservatif*, from a deriv. of Lat. *conserva're*, preserve; *con* + *serva're*, keep]: in politics, those who oppose radical changes in institutions or laws. In England those formerly called Tories are now termed Conservatives. See POLITICAL PARTIES.

Conserva'tors of the Peace: formerly, in England, the wardens of the peace, answering to the modern justices of the peace, appointed to maintain order and police supervision in their counties. The term is now specifically applied to the sovereign, who is the principal conservator of the peace, the lord chancellor, the lord treasurer, the lord high constable, the justices of the queen's bench, and the master of the rolls, who, by virtue of their offices, have power to commit breakers of the peace anywhere.

Revised by F. STURGES ALLEN.

Conservatory [as if from a Lat. **conservatorium*, deriv. of *conserva're*, *conserva'tus*, preserve, like *audito'rium*, *deverso'rium*, and signifying a place where things are preserved, a repository]: a glass-house in which plants are kept while blooming or in an ornamental condition. The plants are grown in a general greenhouse or forcing-house, and taken to the conservatory house or room as they reach their ornamental stage. The term is often loosely applied to any ornamental greenhouse. See GREENHOUSE.

Conservatory [same word as preceding, but serving as a translation of Ital. *conservatorio*, in which the special meaning "a home for orphans and foundlings" had developed into "school of music" on account of the instruction in music given at these homes or hospitals]: a school or place of public instruction and training designed to conserve and promote the study of some branch of science or art, but more particularly music. Such schools are of ancient origin, and were probably founded by ecclesiastics for the purpose of improving the character of church music. They were originally charity schools, recruited from foundlings and orphans of both sexes. The first conservatory was the famous one of Santa Maria di Loreto in Naples, founded by Giovanni di Tappia in 1537. Among the most famous modern conservatories may be mentioned the Conservatoire de Musique, of Paris (founded in 1874), those of Vienna (1816), Brussels (1833), and Leipzig (1842). There are several successful schools of music in the U. S. called conservatories, among which is the National Conservatory, in New York.

Conshohock'en: borough; Montgomery co., Pa. (for location of county, see map of Pennsylvania, ref. 6–I); on Pa. and Phil. and Reading R. Rs., and on the Schuylkill river and canal; 13 miles N. W. of Philadelphia. It has 10 churches, free library, 6 schools, rolling-mills, blast furnaces, potteries, tube-works, quarries, cinder-crusher, planing-mills, engraving-works, manufactories of woolen and cotton goods, shoddy, boilers, machinery, and towels. The borough has water-works and electric and gas light plants. Pop. (1880) 4,561; (1890) 5,470; (1900) 5,762.

EDITOR OF "RECORDER."

Considérant, kōn'sĕĕ'dā'raăn', VICTOR: French socialist; b. at Salins, Oct. 12, 1808; was the chief disciple of Fourier. He became the editor of the *Démocratie Pacifique* in 1845, and a member of the National Assembly in 1848. He wrote *Destinée Sociale* (3 vols., 1834–44). He afterward founded a colony called Reunion, near San Antonio, Tex., but returned to France in 1869. D. in Paris, Dec. 27, 1893.

Consideration [from Lat. *considera'tio*, deriv. of *considera're*, examine, contemplate; literally, observe the stars; *con* + *sidus*, constellation. The word was probably, like *desidera're*, a technical term of astrology]: mature thought, serious deliberation, meditation; also motive of action, reason. In law, the material cause of a contract, the reason which induces a contracting party to make a contract. The leading distinction respecting considerations is that they are either *good* or *valuable*. A *valuable* consideration either confers some benefit on the promisor or causes some inconvenience or damage to the promisee. Under these rules marriage is a valuable consideration. A good consideration is based upon relationship or natural love or affection, and is of avail only in an executed contract, e. g. in case of a deed of land where it has been delivered. The term good consideration is also used in a broader sense, including valuable considerations, for any consideration sufficient to sustain a contract. See CONTRACT and FRAUDULENT CONVEYANCE.

Revised by F. STURGES ALLEN.

Consignee: in mercantile law, the person to whom goods are sent or transferred, either as his own or for the carrying out of some purpose, such as sale or safe keeping. See BILL OF LADING and SHIPPING.

Consignment: in mercantile law, the act of consigning; also the goods sent or transferred to a consignee.

Consistory [from Lat. *consisto'rium*, meeting-place, deriv. of *consis'tere*, take one's place, locate one's self]: the place of meeting of the cabinet of the Roman emperors; the name is also applied to the council of cardinals, sometimes assisted by other prelates, who attend in person or by proxy, which meets in the Vatican to advise the pope in ecclesiastical and temporal affairs. A court under this title for the regulation of discipline and worship, composed of civil and ecclesiastical jurists, was established by the Lutheran princes of Germany at the time of the Reformation. The earliest was that of Wittenberg, founded in 1537. The lower Church courts of the Reformed ("Dutch" and "German") Churches in the U. S. are also called consistories.

Consolato del Mare: a code of early maritime law, to govern the states trading together along the Mediterranean, supposed to date from the fourteenth century. This code is not to be considered a body of maritime law promulgated by the power and authority of a single people, but rather as a compendium of the sea laws and usages then in vogue on the shores of the Mediterranean, in which all powers trading together within certain limits could unite because the local law of each was represented in it and formed a part of it. Founded upon the Roman law, it includes (1) those rules governing the maritime relations of commercial states and their subjects in time of peace; and (2) the rules relating to a state of war. It is the recognized basis of modern maritime law, both English and continental. Thus it lays down the rule that the nationality of property, both ships and goods, determines its liability to capture, a principle still in vogue unless altered by treaty.

THEODORE S. WOOLSEY.

Consols [clip-form of *consolidated* (*annuities*); cf. *cab* for *cabriolet*, *gents* for *gentlemen*]: the funded debt of Great Britain, so called from the interest, which was termed "consolidated annuities." This debt was contracted by loans negotiated at different times and at various rates of interest. To obviate the confusion which arose from the variety of stocks thus created, they were consolidated into one fund in 1750–57. Consols or the consolidated three per cents. were converted in 1888 into consolidated stock bearing $2\frac{3}{4}$ per cent. interest until 1903 and $2\frac{1}{2}$ per cent. thereafter.

Consonance [from Lat. *consonan'tia*, harmony; *con*, together + *sona're*, sound]: in music, a combination of notes sounding together smoothly, without any of the harshness produced by the disturbance of beats. Such beats, as has been long known, are produced by the coincidence or opposition of the overtones, which almost always accompany the fundamental notes. This must be taken with some limitation, as the fourth is regarded as a dissonance, though it has no beats. The effect of a consonance is due to the simplicity of the ratio of the vibration numbers of the constituent tones. Within the limits of the octave the consonances and the ratios are: the octave, $\frac{1}{2}$; the fifth, $\frac{2}{3}$; fourth, $\frac{3}{4}$; major third, $\frac{4}{5}$; minor third, $\frac{5}{6}$; major sixth, $\frac{3}{5}$; minor sixth, $\frac{5}{8}$. There is thus but one chord of consonances in music, namely, the common chord, being a bass note with its third, fifth, and octave. The consonances of the unison, the octave, the fifth, and fourth are called perfect. The imperfect are the major and minor thirds and the major and minor sixths. Two perfect consonances following each other in simple progression are not permissible.

Consonant [from Lat. *con'sonans*; *con*, with + *sona're*, sound]: a sound so named because it is generally used in the mechanism of speech only in association with another sound called a vowel. This method of defining vowel and consonant according to their respective *functions* in the formation of the syllable is open, however, to the objection that it forbids of a definite and final classification of existing sounds. Vowel-sounds may be used as consonants, as *i* in *eye* (pron. *a i*), and consonant-sounds may be used as vowels; cf. *little* (pron. *litl*), *pst!* If, therefore, we are to give a definition by which vowels and consonants may be always identified, it must be based upon their physiological character rather than their functions. The terms "syllabic" and "non-syllabic" may then be substituted to denote the classification according to function. Vowels may be defined according to their character as free currents of breath for which the organs of the mouth and nose serve only to give resonance, not to add noise (Ger. *Geräusch*). Consonants are produced by narrowing or checking the current of breath, and involve noise produced by the closing or opening of the organs of the mouth or by the friction of the current against their walls. Sounds which lie near the boundary between the two classes are the liquids *r*, *l* and the nasals *m*, *n*, etc.; but the characteristic noise produced at the beginning or end of these sounds through the narrowing or closure classes them with the consonants. Consonants which are produced by a friction of the current of breath against the walls of the narrowed organs of the mouth are called *spirants* (also *fricatives*; Germ. *Reihelaute*, *Dauerlaute*, *Schleifer*), thus *s*, *z*, *f*, *v*, þ, ð. Those which are produced by stoppage of the current, as *t* in *at*, or by bursting the obstruction, as *t* in *to*, are called *explosives* (also *stops*, *checks*, *mutes*; Germ. *Verschlusslaute*, *Explosivlaute*, *Momentanlaute*, *Schlaglaute*, *Klapper*). Consonants are *voiced* (also called *sonant*, *mediæ*; Germ. *tönend*, *stimmhaft*) when the vocal chords are trilled by the breath producing them, otherwise *voiceless* (also *surd*, *tenues*; Germ. *tonlos*, *stimmlos*). Thus voiced are *g*, *d*, *b*, *z*, *v*; voiceless, *k*, *t*, *p*, *s*, *f*. BENJ. IDE WHEELER.

Consort [from Lat. *con'sors*, *consor'tis*, having equal share with, fellow-participant; *con*, together + *sors*, lot]: the name given in Great Britain to the husband or wife of the sovereign. The name queen-consort is used to distinguish the wife of the king from a queen who reigns in her own right, as, for example, Queen Victoria, and also from a queen-dowager, the widow of a former king. In 1857 Prince Albert, the husband of Queen Victoria, received the title of Prince Consort.

Conspiracy [from Lat. *conspira'tio*, agreement, co-operation, plot, literally breathing together; *con*, together + *spira're*, breathe]: an agreement between several persons to commit some crime, as to kill a ruler or deprive him of power. In law, an agreement of two or more persons to carry into effect some unlawful purpose, or to accomplish some lawful purpose by unlawful means. It is a crime of which the true basis is the unlawful combination, and at the common law is complete, and may be prosecuted, though no overt act has been performed. By statute, however, in many of the States the offense is not complete without the commission of an overt act with a view to the accomplishment of the design agreed upon. Statute law in some instances makes a conspiracy a grave offense, as, e. g. to destroy a ship with intent to injure insurers. Revised by F. STURGES ALLEN.

Constable: [from O. Fr. *conestable* (> Mod. Fr. *connétable*); Ital. *contestabile* < Lat. *comes stabuli*, i. e. chief hostler]: an officer of many of the mediæval monarchies, particularly France, England, and Scotland, who had high military and judicial rank. The office at first was one of comparative unimportance, but its importance gradually increased until the constable became *ex-officio* commander-in-chief of the army, the supreme military judge, and chief arbitrator in questions of chivalry. In France, Mathieu de Montmorenci, who became constable in 1218, was the first who had the supreme command. The office was abolished in 1627. Napoleon I. appointed his brother Louis constable of the empire, and Berthier vice-constable. Under the Restoration the dignity was again abolished. In England, Henry VIII., finding the fees of the office burdensome to the crown, in 1514 discharged the Duke of Buckingham from the office, and since that date a lord high constable has been appointed only for occasions of great state ceremonies, such as a coronation. In Scotland the office has been hereditary in the family of Hay, Earls of Errol, since 1314, but without its ancient powers. A constable in the general sense of the word is now an inferior civil officer charged with the duty of keeping the peace, invested with limited judicial powers, and having authority to arrest without process on a reasonable suspicion of felony, to execute civil and criminal processes, etc. In Great Britain there are two classes, constables of the hundred, or high constables, whose office is now largely fallen into disuse, and petty constables or constables of the vill. In the U. S. a constable answers to the petty constable of Great Britain. In many cities the chief constable is called high constable.
Revised by F. STURGES ALLEN.

Constable, JOHN: landscape-painter; b. at East Bergholt, Suffolk, England, June 11, 1776; d. in London, Mar. 30, 1837. Pupil of Royal Academy, Joseph Farrington, and R. R. Reinagle, London. He first painted figures and portraits, but took up landscape, and exhibited his first picture in that branch of art in 1802. He was not appreciated in England, but in France his work was very highly considered and he was recognized as a master. The modern French school of landscape-painting is founded on Constable. He was elected Royal Academician, London, in 1829, when his worth had been recognized on the Continent. His pictures are wonderfully harmonious in tone, and depict generally landscape "effects." Several of his works are in the Louvre and *Cornfield* (1826), *The Valley Farm* (1835), and *Barnes Common* are in the National Gallery, London. Two works in the Metropolitan Museum, New York, do not well represent him, but there is a remarkably fine one in the collection of William H. Fuller, New York. WILLIAM A. COFFIN.

Constance: a city of Baden; on the Rhine and the southwest shore of the Lake of Constance; 35 miles N. E. of Zurich (see map of German Empire, ref. 8–D). It is one of the oldest towns in Germany, and was formerly a free imperial city. It has a magnificent cathedral, founded in the eleventh century; also manufactures of silk and cotton goods and watches. Here was held in 1414–18 an important council of the Church. Pop. (1895) 18,671.

Constance, Council of (Lat. *Concilium Constantinense*): the seventeenth of the œcumenical councils of the Roman Catholic Church; was convened by writ of the German Emperor Sigismund, with the consent and concurrence of John XXIII., and opened on All Saints Day, 1414, by John XXIII., one of the three claimants of the papacy. There were present during parts of the session, besides the emperor, seven patriarchs, twenty-one cardinals, 114 bishops and archbishops, besides many princes, nobles, and ambassadors from most of the Catholic powers and from the Emperor Michael Palæologus. Representatives were also present from the principal universities of Europe. One of the objects of this council was the ending of the schism caused by the rival popes (John XXIII., Gregory XII., and Benedict XIII.). This object was accomplished by the deposition of John XXIII. and Benedict XIII., and the voluntary abdication of Gregory XII., 1415, and choosing Martin V. in their stead. The council also condemned the opinions of Wickliffe and Huss, and cited the latter to appear before it (1414). In the following year Huss was burned at the stake for heresy, at Constance. On the imperial safeguard, and the questions connected therewith, see Palacky, *Geschichte von Boehmen* (vol. iii., pp. 317, 352); *Historisch-politische Blätter* (vol. iv., p. 402); Duex, *Nicolaus von Cusa* (vol. i., p. 51); Wetzer and Welte's *Kirchenlexikon* (2d ed.), art. Huss (Hefele) (see Huss).

The acts of the council have been collected by von der Hardt, *Magnum Concilium Constantinense* (Frankfort-Leipzig, 1697–1700, 6 vols. fol.). The chronicle of Ulrich von Reichenthal (Augsburg, 1536) and the compendium of Schelstrate (Rome, 1686) contain rich materials for the history of the council, which has been treated by Lenfant, *Histoire du Concile de Constance* (Berlin, 1714), from a non-Catholic view point. Fresh materials have been added by the late publications of Dr. Finke, of Münster.

The Roman Church has always recognized the œcumenical character of the Council of Constance in the sessions following the election of Martin V. (42–45), and in the other sessions so far as they treated of matters pertaining to the interest of the faith and the salvation of souls, and did not derogate from the rights, dignity, and supremacy of the apostolic see. Hence the famous early sessions (3–5) have not been accepted by her because of their revolutionary principles. See Hefele, *Conciliengeschichte*, 2d ed., vol. i., pp. 61–62. Revised by J. J. KEANE.

Constance, Lake of [anc. *Brigantinus Lacus*; Germ. *Boden See*]: a lake of Central Europe; borders on Baden, Bavaria, Switzerland, the Tyrol, and Würtemberg; 1,290 feet above the ocean-level. Area, 184 sq. miles. It is about 40 miles long, and 9 miles wide at the broadest part. The greatest depth is 912 feet. The Rhine enters this lake near the southeastern end, and issues from the northwestern extremity. In 1770 the water rose in one hour 20 feet above the ordinary level. This lake is said to contain twenty-five species of fish, including salmon. Several steamboats ply on it.

Con'stans, FLAVIUS JULIUS, **I.**: b. about 320 A. D.; was the third son of the Emperor Constantine I. On the death of his father, in 337, he became the sovereign of Italy, Africa, etc. His brother Constantine invaded Italy, and was killed in battle in 340, after which Constans was master of all the Western empire. He was defeated and killed by Magnentius early in 350 A. D.

Constans, JEAN ANTOINE ERNEST: French politician; b. May 3, 1833, in Béziers; Professor of Law in Toulouse; republican member Chamber of Deputies 1876; Minister of the Interior 1880–82; minister to China 1885–87; governor-general of Indo-China 1887–88; elected senator 1889; Minister of the Interior 1889–92. His vigorous measures overthrew Boulangism. He was one of the few public men of France untouched by the Panama scandal, and remains one of the strongest men in French political life. C. H. T.

Constant, JEAN JOSEPH BENJAMIN: French painter. See BENJAMIN-CONSTANT, JEAN JOSEPH.

Constant de Rebecque, kōn'staṅ'de-rā'bek'. BENJAMIN: French political writer; b. at Lausanne, Oct. 25, 1767; d. in Paris, Dec. 10, 1830. Of French descent, he studied at Oxford, Erlangen, and Edinburgh, and finally settled in 1795 in Paris, where he joined the moderate republican party, but, having become obnoxious to Napoleon, he was expelled from the Tribunate in 1802, and soon after found it advisable to retire from France, together with Madame de Staël. After spending several years in Germany, chiefly engaged in literary pursuits, he returned to France immediately after the overthrow of Napoleon. When the July revolution broke out, he was in his country-house; but he immediately repaired to Paris, and aided in placing Louis Philippe on the throne. His principal political works are *On the Spirit of Conquest and Usurpation* (1813) and *Cours de Politique Constitutionelle* (1817–20, 4 vols.). His principal philosophical works are *On Religion, Considered in its Sources, Forms, and Developments* (1823–31, 5 vols.), and *Religion of Rome* (2 vols.). His speeches were collected by T. P. Pagés (1832–33, 3 vols.).

Constan'tia: a superior wine from the Cape Colony, South Africa, produced upon the three Constantia estates, 12 miles S. of Cape Town. It is free from the earthy taste which characterizes ordinary Cape wines. It owes its excellence to the highly alkaline soil, the choice variety of grape employed in making it, the genial exposure of the estates, and perhaps more than all to care and skill in its preparation. There are white and red Constantia wines.

Constantine (anc. *Cirta*, or *Kirtha*): city of Algeria; capital of province of same name, and seat of a Roman Catholic bishop; on a high hill surrounded on three sides by ravines; lat. 36° 24′ N., lon. 6° 8′ E. (see map of Africa, ref. 1–D). It is over 2,000 feet above the level of the sea. It is surrounded by walls built by the Arabs, and has been greatly improved, resembling a modern French town with broad streets. Here are manufactures of woolen cloth and saddlery. Remains of the ancient Roman *Cirta*, which was a great city of Numidia, are visible here. This place was besieged by the French in 1836; Oct., 1837, it was taken by assault. Pop. (1891) 46,581.

Constantine: village; St. Joseph co., Mich. (for location of county, see map of Michigan, ref. 8–H); on Lake Shore and Mich. So. R. R. and on St. Joseph river; 94 miles by railroad S. W. of Lansing. Has abundant water-power and a large peppermint-oil industry. Pop. (1880) 1,405; (1890) 1,346; (1900) 1,226.

Constantine, FLAVIUS VALERIUS AURELIUS, surnamed THE GREAT: the first Christian Emperor of Rome; b. Feb. 27, 274 A. D. He was a son of Constantius Chlorus and his wife Helena, and was originally a pagan. In the reign of Diocletian he gained distinction by his military talents, and became a favorite of the army. He was at York when his father died in July, 306, and was then proclaimed emperor by the army under his command. Galerius, who regarded him with jealous enmity, granted to him the title of cæsar, and conferred the higher rank of augustus on his own son, Severus. Maximian and his son Maxentius assumed imperial power at Rome, so that in 307 A. D. six men became competitors for the empire. Constantine married Fausta, a daughter of Maximian. After the death of Galerius (311), Licinius and Maximian were masters of the eastern provinces of the empire, and Constantine reigned in Gaul. In 312 Maxentius was defeated and killed by the army of Constantine, who then entered the city of Rome and became master of all the western part of the empire, including Italy and Africa. On the eve of this decisive battle, he is said to have seen a sign of the cross in the sky, bearing the inscription: Ἐν τούτῳ νίκα (By this conquer). He afterward treated the Christians with increasing favor, and adopted wise measures for the promotion of public prosperity and order.

In 314 he waged a short war against Licinius, who was the sole emperor of the eastern provinces. This war was followed by a peace of nine years, during which Constantine devoted himself to political reforms, organized a better form of government, and adopted a more humane code of laws, which recognized Christianity as the religion of the state. He renewed in 323 the war against Licinius, whom he defeated near Adrianople. After another decisive victory he reigned over the Roman empire with undivided power. He assembled at Nicæa, in 325 A. D., the first general council of the Church with the consent and concurrence of the pope, and moderately favored orthodoxy in the controversy against the Arians. He had a son, Crispus, who was accomplished and popular. Having been falsely accused of a crime by Fausta, his stepmother, Crispus was put to death. Constantine selected Byzantium as his capital, and enlarged or rebuilt that city, to which he gave the name of New Rome or Constantinople—"city of Constantine." This was founded by imposing ceremonies in May, 330 A. D. In the latter part of his life he showed favor to the Arians, and was baptized by an Arian bishop only a week before his death. The question is still warmly debated whether the man, or only the emperor, was converted. He died at Nicomedia, May 22, 337 A. D., having divided the empire between his three sons, Constantine, Constantius, and Constans. He has a high reputation as a statesman and emperor.

AUTHORITIES.—Eusebius, *Vita Constantini*, a translation of the same in *The Nicene and Post-Nicene Fathers*, (2d series, vol. i., 1890); Gibbon, *Decline and Fall of the Roman Empire*; Joseph Fletcher, *Life of Constantine the Great* (1852).

Constantine (or **Constantinus**) **VII.**: Emperor of the East, surnamed PORPHYROGENITUS [Gr. Πορφυρογέννητος, i. e. born to the purple or born in purple]: b. in 905 A. D. He was a son of the Emperor Leo VI., who died in 911. Romanus Lecapenus usurped the imperial power in 919, after which Constantine passed many years in retirement and study. He began to reign in 944. He wrote several works of some merit. D. in 959.

Constantine XIII., surnamed PALÆOLOGUS: the last Emperor of Constantinople; b. in 1394. He succeeded his brother, John VII., in 1448. The Turkish sultan, Mahomet II., besieged Constantinople with an army of 250,000 men, and took it by storm in 1453. Constantine was killed, fighting bravely to the last, May 29, 1453.

Constantine, Nikolaevitch: Grand Duke of Russia; second son of the Emperor Nicholas; b. Sept. 21, 1827. He became grand admiral of the fleet and a favorite leader of the old Russian party. In the Crimean war (1854–55) he commanded the Baltic fleet and acted on the defensive. He married the Princess Alexandra of Saxe-Altenburg in 1848. He was in 1862 governor-general of Poland, but resigned in 1863. In 1865 he was appointed, and in 1878 reappointed, president of the Council of State, but in 1881 was dismissed from office and from command of the fleet on suspicion of intriguing with the revolutionary party. He lost his reason in 1890, and died Jan. 25, 1892.

Constantine, Pavlovitch: grand duke: second son of the Emperor Paul of Russia; b. May 8, 1779. He commanded a corps at the battle of Austerlitz (1805), and displayed in several actions a courage bordering on rashness. In 1814 he was appointed generalissimo of the Polish troops and viceroy of Poland. When Alexander died without issue in 1825, Constantine was the legitimate heir, but he renounced the throne in favor of his younger brother, Nicholas. In the reign of Nicholas he was Viceroy of Poland, and by his tyranny provoked the Poles to revolt in 1830. Died of cholera, June 27, 1831.

Constantinople [Gr. Κωνσταντινούπολις, Constantine's city The Turkish name is *Istamboul* or *Stamboul*; the Arabic and official Turkish *Constantinié*; the Mod. Gr. ἡ Πόλις, (The City); and the Eccles. Gr. ἡ Νέα Ῥώμη (The New Rome)]: the capital of the Ottoman empire; often styled the Queen of the East; situated upon the Sea of Marmora in Europe, at the southwest extremity of the Thracian Bosphorus. Lat. 41° 1′ N., lon. 28° 59′ E. of Greenwich, 106° E. of Washington; 5,622 miles E. of New York; two days' journey by rail from Vienna and three days' from Paris (see map of Turkey, ref. 4–E).

Situation.—The city occupies a triangular peninsula, having the Golden Horn, an inlet of the Bosphorus, on the N. Two pontoon bridges across this inlet, one of iron, connect the city proper with the populous suburb of Galata-Pera, where foreigners reside and the European legations and embassies are located. A mile distant eastward across the Bosphorus is the Asiatic city of Scutari. Constantinople spreads over seven hills (greatest altitude, 291 feet); six extending S. are nearly parallel, while the seventh, the southernmost and largest, is cut off from the rest by the river Lyeos, which traverses the city. This diversified surface, covered with numerous palaces, mosques, minarets, gardens, and cypresses, presents an aspect marvelously picturesque and imposing. The site combines in almost unequaled degree capability of defense, facility of trade, the choicest gifts of nature, and exquisite scenery. Its commanding geographical situation renders Constantinople the key of Eastern Europe and Asia Minor. The Golden Horn affords a safe and commodious harbor, nearly 5 miles long and from 1 to 4 furlongs wide. Its depth and entire freedom from tides enable the largest vessels to approach close to the shore and discharge with ease.

The *internal appearance* of Constantinople is distinctively Oriental. The streets without sidewalks, bordered by small wooden houses, are generally crooked, narrow, badly paved, dirty, and swarm with dogs. In the regions ravaged by terrible conflagrations in 1865, 1866, 1870, 1878, and 1890, however, broad thoroughfares and sidewalks and spacious stone houses have been substituted. All the streets are named, the houses numbered, and street-lamps have become common. Quays, tramways, a tunnel (Galata-Pera), a railway, omnibuses, public cabs, and telegraph wires somewhat Europeanize Constantinople. A funereal aspect is given by its vast and crowded cemeteries.

Public Buildings.—Constantinople and its suburbs contain 641 mosques, 12 called imperial; 158 churches and chapels (41 Armenian, 30 Roman Catholic, 68 Greek, 19 Protestant); 40 synagogues; 209 khans (Oriental inns); 178 imarets (mosque hospitals); over 300 tekiés (dervish convents). The principal mosques are Aya Sophia, with four minarets; originally a Christian church, designed by Anthemius (*q. v.*), and built by Constantine, successively rebuilt in 360, in 415, and lastly by Justinian 532–37. It was converted into a mosque by Mohammed II. (1453), and repaired (1847–49) at an expense of over $1,500,000 by the Fossatis. It is a Greek cross, 253 feet by 239, surmounted by a flattened dome 108 feet in diameter, its apex 180 feet high. It is adorned with 107 columns from the chief ancient temples, and is rich in marbles and mosaics, the latter now covered over and invisible. (See Architecture.) The mosque of Suleïman I., also with four minarets, a grandiose imitation of St. Sophia; mosque of Achmet I., rich in tiles, with six minarets, only the Kaaba at Mecca having a larger or equal number; the mosque of Mohammed II., of Bayezid I., of Selim I., the Yeni Validé Djami (mosque), and the Nouri Osmanié, the two latter built entirely of white marble. Other most interesting mosques that had once been Christian churches are Kioutchouk Aya Sophia, an octagon, built by Justinian; Kilissé Djami and Mir Achor Djami, both erected in the fifth century, the latter a basilica; and Kachrié Djami, with exquisite, well-preserved mosaics. The Government buildings are generally unpretentious. Outside the offices of the grand vizier is the elaborate gate from which the Government takes the name of the Sublime Porte. The imperial palaces and the residence of the sultan are on the Bosphorus. The barracks are enormous yellow buildings, clean and well kept. There are two museums—one of Turkish costumes, one of antiquities. In the latter are the famous eighteen sarcophagi from Sidon, one perhaps that of Alexander the Great. The Grand Bazar (Tcharshi) consists of connected covered streets, lined with 3,217 little shops, and is the city's commercial center and its most Oriental feature. The Seraï (seraglio), the residence of the sultans from 1520 to 1839, occupies the eastern extremity of Constantinople, almost the entire site of Byzantium. Three gates in parallel walls admit to the "Abode of Felicity." Here in splendid gardens are the divan, throne room, treasury, library, kiosks (summer houses), harem, (former residence of the imperial ladies), and the Chamber of the Holy Mantle. Successive conflagrations have destroyed many buildings and much impaired the beauty of the Seraï.

The *climate* is at all seasons variable, subject to sudden and extreme changes. One year furnishes small indication of the next. North and south winds predominate. From 1856 to 1888—highest temperature, 99·14° F.; lowest, 17·24°; average, 57·74°: barometer, Fortins system, greatest, 771·2; least, 755·1; annual average, 762·1: greatest yearly rainfall (1877), 42 inches; least (1882), 19 inches; yearly average, rainy days, 84; tempest, 15; snowy, 14; other days, 252.

The *inhabitants* of Constantinople and suburbs, according to the official census of 1885, numbered 873,565; in 1893 about 925,000. Probably 450,000 are Ottomans, 250,000 Greeks, 165,000 Armenians, 30,000 Jews, and 30,000 foreigners, Levantines, and members of less numerous subject races. Formerly each nationality was confined to its own quarter, a restriction gradually relaxed. The Greeks center at Phanar on the Golden Horn, around the patriarchal church and palace; there in the monastery of the Holy Sepulcher of Jerusalem Bishop Bryennios discovered the Teaching of the Twelve Apostles. The Armenian quarter and patriarchate are at Koum Kapon, on the Marmora: the Jews crowd unsavory Balat, while the Ottomans monopolize all the most desirable localities. Constantinople is the residence of Greek, Armenian, and Armeno-Catholic patriarchs, of a Bulgarian exarch, a Protestant vekil (representative), and a grand rabbi; also of the Sheik ul Islam (high priest of Islam), who under the sultan is spiritual head of the Mussulman Church. The principal foreign nations have their own post-offices, hospitals, and schools.

Education.—Schools are numerous, one being attached to every mosque and church, but not generally of a high order. The Armenians, and especially the Greeks, have fine institutions. The American College at Scutari and Robert College on the Bosphorus are excellent. The Ottoman Government maintains good naval, military, medical, and polytechnic schools, and the school of Galata Seraï, modeled after a French *lycée*. The stately Bible House is the headquarters of the Protestant Bible societies and missions throughout the empire. A library, mostly MSS., is attached to each principal mosque; and there is a respectable international library on the third hill. Forty-three newspapers are published in ten languages—Arabic, Armenian, Bulgarian, English, French, Greek, Hebrew-Spanish, Italian, Persian and Turkish—none wholly in English. Nineteen of these are dailies.

Manufactures and Commerce.—The former hardly exist, having steadily declined since 1839. Even the importance of Constantinople as entrepôt or commercial center has been largely transferred since 1878 to Batoum, Odessa, and Smyrna. Shipping is almost entirely in the hands of foreigners. Exports: Wool, raw silk, carpets, tobacco, rags, hides, and valonea. Imports: Grain, sugar, coffee, cattle, drugs, and all kinds of manufactured articles.

History.—Constantine founded Constantinople on the site of Byzantium (*q. v.*), with largely increased territory, and dedicated it May 11, 330, "to the service of Christ." Since then, though besieged thirty-one times, it has been captured only by the Latin crusaders (1203–04) and by Mohammed II. (1453). Among the most memorable sieges may be mentioned that by the Goths in 379; by the Arabs and Persians in 616–26; and by the Arabs themselves in 672–79, and also 717–18; by the Bulgarians in 813 and 843; by the Russians in 865 (who also made attacks in 904, 951, and 1043); by Bayezid II. in 1391–98: and by Murad II. in 1422. The chief events in the history of the city are as follows: The introduction of the silkworm in 530; the separation of the Eastern and Western Churches in 1054; the death of 160,000 persons from the plague in 1812; destruction of the janizaries in 1826; the proclamation of reforms by Hatti Sheriff in 1839; the first Protestant Church organized in 1846; railway to Adrianople was opened in 1873; the accession of Sultan Abdul Hamid Khan II., the thirty-fourth Ottoman sovereign, in 1876; in 1878 the treaty of San Stefano; railway to Vienna was completed in 1888. Several œcumenical councils have been held in Constantinople in 381, in 553, and in 680, in 754 and in 869.

Antiquities.—(*a*) The walls entirely surround the city; that on the west side (erected in 413) is 4 miles long, and has seven gates. It is a triple wall with 179 high towers and a moat 60 feet wide, all kept in scrupulous repair till 1453, but now a magnificent ruin. (*b*) The sixteen cisterns, two dating from Constantine, are the largest in the world; one of Philoxenos, 196 feet long, 173 feet wide, with 224 columns in 16 rows, supporting the roof; one Basiliké, now Yeri Batan Seraï (underground palace), also roofed, 390 feet by 174 feet, with 336 marble columns in 28 rows. (*c*) The columns: the "Burnt Column," erected by Constantine; the columns of Theodosius, of Marcian; the column in the Atmeïdan (Hippodrome); the "Built Column" of Constantine VII.; the obelisk of Thebes; and the brazen serpent of Delphi. The last mentioned (consecrated 476 B. C. by the Greeks to Apollo) was brought from the oracle by Constantine. On it are still visible the names of Greek cities which fought the Persians. This is the most precious antiquity in the city. (*d*) Ancient Christian churches, many of which are now mosques. (*e*) The "Tower of Christ" in Galata, first erected in the fifth century. (*f*) Sarcophagi in various parts of the city, one near the Church of St. Irene, probably that of Constantine. (*g*) The palaces of Justinian and the Hebdomon (Tekour Seraï); prison of Anemas; the Seven Towers (Yedi Koulé), formerly a Greek fortress called Heptapyrgion; and the aqueduct of Valens.

EDWIN A. GROSVENOR.

Constan'tius I., called **Constantius Chlo'rus**, FLAVIUS VALERIUS: a Roman emperor; b. about 250 A. D.; the father of Constantine the Great. The Emperors Diocletian and Maximian chose Constantius and Galerius in 292 A. D., and gave to each the title of cæsar. Constantius ruled over Gaul, Britain, and Spain, and became emperor in 305, when Diocletian abdicated. D. July 25, 306 A. D.

Constantius II., FLAVIUS JULIUS: second son of Constantine I. and Fausta; b. at Sirmium in 317 A. D. He inherited, in accordance with his father's will, the Asiatic provinces and Egypt in 337. He waged war against the Persians, by whom he was several times defeated. He vanquished Magnentius on the Drave in 351, and in Gaul in 353. In 355 he gave the title of cæsar to his cousin Julian. He showed favor to the Arians. He died Nov. 3, 361 A. D., and was succeeded by Julian.

Constellation [from Lat. *constella'tio*, the position of the stars, grouping of the stars, group of stars; *con*, together + *stel'la*, star]: a group or collection of stars. The use of the term has arisen from the obvious fact that the stars are not scattered equally over the heavens, but appear to be collected, to a greater or less extent, into groups. In prehistoric times names were given to these groups, which were sometimes supposed to have been suggested by a fancied resemblance to figures of men, animals, or other objects. In most cases, however, this resemblance is so fanciful that we can hardly suppose the name to have been determined by it. It would seem from Ptolemy's descriptions of the stars and his list of the constellations that long before his time maps of the stars were formed on which the animals, heroes, or objects after which the constellations were named were drawn so as to include all the brighter stars of each constellation. The latter were then designated by the particular part of the man, animal, or object where the star was situated. For example, Aldebaran was in the eye of the bull; three conspicuous stars in Orion formed his belt; a small group formed his head; two bright stars were in his shoulder, etc. Thirty-six constellations are recognized by Ptolemy in the Almagest. In modern times fifty-six have been added to Ptolemy's list, sometimes by dividing up his constellations, and sometimes by adding new ones. At the present time the figures of animals are no longer used, but the entire heavens are divided up into regions bounded by somewhat arbitrary lines, straight or curved, drawn so as to pass through the spaces containing as few conspicuous stars as possible. This inclusion of every part of the heavens in some constellation is the principal point in which the modern system differs from the older one. In the latter many minute stars were regarded as not belonging to any constellation. Within each constellation the brighter stars are distinguished by numbers, or by letters of the Greek alphabet. See STAR.

The following list comprises all the constellations now generally recognized, although some of the more recent ones are understood to be temporary. The first twenty are known as Ptolemy's northern constellations; next come the twelve zodiacal, and then the fifteen southern constellations of Ptolemy; the forty-eighth was added by Tycho Brahe, though first named by Conon the Samian; the next ten are from Hevelius. All after the fifty-fifth are S. of the equator. Those from Indus to Apus inclusive were named by Bayer; the next thirteen are from Lacaille, and the last two from Royer:

1. Ursa Minor, the Lesser Bear.
2. Ursa Major, the Greater Bear.
3. Draco, the Dragon.
4. Cepheus.
5. Boötes, the Herdsman.
6. Corona Borealis, the Northern Crown.
7. Hercules.
8. Lyra, the Lyre.
9. Cygnus, the Swan.
10. Cassiopeia.
11. Perseus.
12. Auriga.
13. Ophiuchus or Serpentarius, the Serpent-bearer.
14. Serpens, the Serpent.
15. Sagitta, the Arrow.
16. Delphinus, the Dolphin.
17. Equuleus, the Little Horse.
18. Pegasus, the Winged Horse.
19. Andromeda.
20. Triangulum Boreale, the Northern Triangle.
21. Aries, the Ram.
22. Taurus, the Bull.
23. Gemini, the Twins.
24. Cancer, the Crab.
25. Leo, the Lion.
26. Virgo, the Virgin.
27. Libra, the Scales.
28. Scorpio, the Scorpion.
29. Sagittarius, the Archer.
30. Capricornus, the Goat.
31. Aquarius, the Water-bearer.
32. Pisces, the Fishes.
33. Cetus, the Whale.
34. Orion.
35. Eridanus, the River Po.
36. Lepus, the Hare.
37. Canis Major, the Greater Dog.
38. Canis Minor, the Lesser Dog.
39. Argo, the Ship Argo.
40. Hydra, the Water-serpent.
41. Crater, the Cup.
42. Corvus, the Crow.
43. Centaurus, the Centaur.
44. Lupus, the Wolf.
45. Ara, the Altar.
46. Corona Australis, the Southern Crown.
47. Piscis Australis, the Southern Fish.
48. Coma Berenices, the Hair of Berenice.
49. Canes Venatici (the Greyhounds, Asterion and Chara).
50. Lacerta, the Lizard.
51. Lynx, the Lynx.
52. Sextans Uraniæ, Tycho's Sextant.
53. Cameleopardalis, the Giraffe.
54. Vulpecula et Anser, the Fox and Goose.
55. Leo Minor, the Lesser Lion.
56. Monoceros, the Unicorn.
57. Indus, the Indian.
58. Grus, the Crane.
59. Phœnix, the Phœnix.
60. Musca, the Fly.
61. Pavo, the Peacock.
62. Toucan, the Toucan.
63. Hydrus, the Water-snake.
64. Dorado, the Swordfish.
65. Piscis Volans, the Flying-fish.
66. Chamæleon, the Chamæleon.
67. Triangulum Australe, the Southern Triangle.
68. Apus, the Bird of Paradise.
69. Apparatus Sculptoris, or Sculptor, the Sculptor's Workshop.
70. Fornax Chemica, the Chemical Furnace.
71. Horologium, the Clock.
72. Recticulum Rhomboidale, the Rhomboidal Net.
73. Cœla Sculptoris, the Graving Tools.
74. Equus Pictorius, the Painter's Easel.
75. Antlia Pneumatica, the Air-pump.
76. Octans, the Octant.
77. Norma, the Square-rule.
78. Circinus, the Compasses.
79. Telescopium, the Telescope.
80. Microscopium, the Microscope.
81. Mons Mensæ, the Table Mountain.
82. Crux Australis, the Southern Cross.
83. Columba Noachi, Noah's Dove.

SIMON NEWCOMB.

Constipation [from Lat. *constipa'tio*, deriv. of *constipa're*, crowd close together; *con*, together + *stipa're*, stuff—referring to that state of the rectum in which it is impacted with fecal matter]: the diseased condition in which there is sluggish action of the bowels. The term is more or less relative, but as a rule a motion of the bowels should occur every twenty-four hours in health. The principal causes which lead to constipation are sedentary habits and errors in diet, digestive disturbances, and a general sluggish condition of the system. There may be special want of secretion of the intestinal juices due to diseases of the intestines, and mechanical constipation may result from narrowing or com-

pression of localized parts of the bowels. In itself constipation is merely a symptom and may lead to no further disturbances. On the other hand, considerable discomfort may result, and headache, drowsiness, or loss of appetite are frequent symptoms. Obstinate constipation may lead to fermentative changes in the intestines and absorption of products of fermentation which are poisonous to the system.

In the treatment of this affection regulation of diet and of exercise claim first attention. Indiscriminate drugging is more frequently harmful than otherwise. The diet should be varied, and should contain food such as brown bread, oatmeal, fruit and vegetables containing slightly irritating refuse. Soothing bland diet is required. Regular exercise and a morning bath followed by vigorous friction are good. Obstinate cases may call for enemata of water, etc.

Constituição: city of Brazil. See PIRACICABA.

Constitution [from Lat. *constitu'tio*, structure, composition, establishment, decree; *con*, together + *statu'ere*, establish]: in the U. S., a written statement of the fundamental rules of government, either of a State or of the U. S. The word as thus used has a widely different signification from that which prevails in Great Britain, where it means simply the leading rules of government, without reference to any formal statement. The British "constitution" thus consists of documents emanating from time to time from the king or from Parliament, and of traditions and customs. These may be collected in treatises and reduced to a systematic form, but have never received the legal sanction indispensable in the U. S.—that of recognition by the nation as distinguished from Parliament. In the U. S. "the people," consisting in each State of those who hold the elective franchise, are by prescribed forms called upon at intervals either to establish the constitution or to amend it. It thus has an authority superior to that of the government organized under it. One extremely important result is that if any of the departments exceed the limits marked out in the constitution, the act is irregular and void. An illustration of the doctrine is found in an act of the legislature which transcends the constitution; the judicial department will declare it void. The courts have no such power in Great Britain. An act of Parliament is commonly said to be "omnipotent"; there is no judicial power which can exercise the function of arresting the regular operation of the act. The power of the courts in the U. S. is, in the best sense of the word, a "veto"—forbidding a direction which has actually been clothed with legislative forms from being carried into effect, on account of its repugnance to the will of the people. The further examination of the subject with reference to the U. S. may be conducted under the following general divisions: I. The mode of originating a constitution; II. The relation between a State and the U. S. Constitution, and the office of each; III. Principal provisions in American constitutions, including "constitutional limitations."

I. The prevailing method of generating or amending a constitution is the "constitutional convention." It is certainly not the only method, since it sometimes happens that a constitution provides special and different modes of amendment, as is the case with the U. S. Constitution and some others. A distinction has been taken between a "constitutional" and a "revolutionary" convention. These do not differ necessarily in their internal character or in their modes of conducting business, but in their origin. A constitutional convention originates by orderly processes—is the creature of law. A revolutionary convention is irregular in its origin. Its ordinances may have a *de facto* validity, and become law on receiving the sanction of the people. The regular method is to have a law of the legislature or a constitutional provision as a basis for the existence of the convention. When a body of delegates of this kind is assembled by legal methods, its powers become a subject of much importance, and are not yet definitely ascertained. Some hold that the convention has all the powers which inhere in the "people" that created it. In other words, it is sovereign. This is startling doctrine, and will scarcely command general assent. Another extreme view in the other direction is that it is a mere deliberative body, having power to discuss propositions, to agree upon them, and to recommend them for adoption. Under this view the convention is but little more than a debating society, with very limited powers for preserving order or securing itself from the intrusion of strangers. The true view would seem to be that while the convention is itself acting in subordination to law, yet it has, as *incidental* to the accomplishment of its purposes, such powers as are necessary to carry them into effect. It may accordingly preserve order, punish contempts of its authority, provide for submission to the vote of the people of its proposed ordinances, and do such other acts as reasonably serve to make deliberation free and complete, and also to secure the full expression of the popular will. There are cases where the constitution of the State itself or the act of the Legislature provides for the calling of a convention in a prescribed manner and with specified powers. While the restrictions of a constitution must be accepted as binding, it may well be doubted whether an act of the Legislature can deprive a convention sanctioned by the people of powers which have been already referred to as incidental to its complete working.

The common method of transacting business is to parcel out among different standing committees the various topics to be provided for, such as a committee on "the bill of rights," "the judiciary," "the legislative department," etc. These committees, after due consideration of the subjects intrusted to them, report to the convention, when the matter is taken up by the entire body, discussed, approved, or rejected. (For detailed information see Jameson, *On Constitutional Conventions.*) The debates in conventions are frequently published in a permanent form, and contain much information of great value on legal and constitutional topics. Reference may be made to the *Madison Papers*, containing debates on the U. S. Constitution; Elliot's *Debates*, and those published in New York, Virginia, Massachusetts, Illinois, and Pennsylvania.

II. *The Relation between a State and the United States Constitution, and the office of each.*—A State constitution is adopted to regulate the action of the various departments of the Government and to secure the rights of the people. It is a common statement that a State government has all the powers possessed by the English Parliament, except so far as it is restrained either by the State or national constitution. The object of a State constitution is not so much to confer power as it is to restrict and define that which already exists. It is to subject the will of the people to prescribed forms, which can not be overcome by an ordinary act of legislation, but only by an amendment of the constitution itself. On the other hand, the U. S. Government is called into existence by a written instrument. It has no powers except those which are contained within it, either in express terms or by reasonable implication. The acts done under its legitimate powers, such as the laws of Congress or treaties with foreign nations, are the supreme law of the land, and all State laws or State constitutions are so far subordinate. It is plain, however, that a State constitution or law may be in conflict with some provision of the U. S. Constitution or law or treaty, or an act of Congress may trench upon legitimate State authority. There must be some power intrusted with the function of deciding these questions in such a way as to keep the two governments within their proper sphere of action. This power appertains to the Supreme Court of the U. S., and in the exercise of its appellate jurisdiction it may review the decisions of State courts for this purpose, under clauses of the "judiciary acts" of Congress passed under the provisions of the Constitution. It thus becomes the final interpreter of the Constitution, and may declare a State law or constitutional provision void as being repugnant to the U. S. Constitution or the laws of Congress or treaties with foreign powers. So, when an act of Congress is not warranted by constitutional rules, it will be declared void. In this way the complex system of government works harmoniously, sound judgment dictating that the rights of the States should be preserved by the courts with the same jealous and scrupulous care as those of the U. S. The court can not exercise this power by the promulgation of an edict or ordinance, but only through the medium of a "case" or controversy between litigating parties. In deciding the case it may proceed upon principles which become a rule for the future, and a body of constitutional law is thus formed which either truly expounds the Constitution or departs from it. If an error be omitted, it can only be rectified by a subsequent act of the court overruling the decision or by an amendment of the Constitution. Another point may be adverted to. A State law may be opposed to a State constitution. The duty of deciding this point regularly devolves upon the courts of the particular State, and the U. S. court follows their lead. However, having once acceded to the State interpretation, if that be subsequently reversed in

the State court, it will not feel bound to change its view, but may adhere to the first construction. There is thus to be collected from the decisions of State courts a mass of what may be called "State constitutional law." Much of this is special in its nature, having but little value beyond State limits. Other parts of it are general in their character, while some portions of it are coincident with decisions in the U. S. court, as in some instances the same restrictions are found in both instruments.

III. It is not intended under this head to advert to the general scheme of the various State and U. S. constitutions. The text of the latter is given hereafter in full. (See CONSTITUTION OF THE UNITED STATES.) Reference will only be made to such provisions in the nature of restrictions as are of a general nature. These are restrictions upon unsound legislation, such as prohibitions of bills of attainder and ex-post facto laws, or laws impairing the obligation of contracts; some of the States in the same spirit prohibit divorces by the Legislature. Or they may be limitations upon legislation opposed to the spirit of American institutions. Under this head may be ranked prohibitions against granting titles of nobility. There are also limitations for the protection of individual rights addressed to all departments of government. They tend to secure liberty of speech and of the press, religious freedom, to prevent deprivation of rights except through orderly processes in courts of justice, including trial by jury; also to prevent renewed trials for the same offense, to check excessive punishments, etc. A number of such provisions are found in the earlier amendments to the U. S. Constitution. It is an important remark that these were only intended to bind the action of Congress or other departments of the general government. For this reason like clauses are inserted in the State constitutions. The last three amendments (thirteenth, fourteenth, and fifteenth) are operative upon the States as well as upon Congress. Many of the provisions now considered are taken from the English law, and in the very words of statutes or text-writers. They thus become fundamental law in the sense in which they were used in the country whence they were derived. The last three amendments of the U. S. Constitution were specially intended to secure rights to citizens of African descent, though not confined to them. (See CITIZEN.) Fundamental provisions of this sort, when considered together, are frequently termed a "bill of rights." (See BILL OF RIGHTS.) There is in some instances a tendency to insert in the State constitutions matters which are more properly the subject of legislation. Sometimes a political party desires to make its policy on a question like that of internal improvements a permanent one, and secures to that end a provision in the constitution; or perhaps legislatures prove themselves to be unwise or even corrupt, and it is thought well to reduce their capacity to do mischief by shearing them of their legitimate powers. Provisions framed to accomplish such objects do not long prevail, and a reaction in public sentiment soon leads to an amendment of the constitution. The better view is that constitutions should only deal with fundamental law. When legislators are ignorant or vicious, the true remedy is at the ballot-box, where the voters may show their will to have more suitable men. See on the general subject, Cooley, *On Constitutional Limitations*; Hough's *Collection of State Constitutions*; also the same author's *Annotated New York Constitution of 1846*; Story, *On the United States Constitution*; Kent's *Commentaries*; and the treatises of Rawle, Sargent, and Paschal. The most complete view of the principles governing the whole subject may be obtained from the opinions written by the judges of the Supreme Court of the U. S. in deciding specific cases involving the construction of the Constitution. These are collected in the reports of Dallas, Cranch, Wheaton, Peters, Howard, Black, Wallace, etc. Abstracts of the points decided may be found in Brightly's *Digest* and Abbott's *National Digests*. These works may be used for easy reference to the volumes of the reports above named. Full expositions of questions arising under the various State constitutions will in like manner be found in the public reports of the decisions of the courts of the respective States.

T. W. DWIGHT.

Constitution of the United States: the fundamental or organic law of the union of the States, thereby united. This, with all acts of the States in Congress assembled, and all treaties made in pursuance of its provisions, constitutes the supreme law of the land throughout the Union. The first Constitution of the U. S. was the Articles of Confederation, adopted by the States during the war for their independence. (See CONFEDERATION, ARTICLES OF; and consult Curtis, *History of the Constitution of the United States*, p. 139; Sparks, *Writings of Washington*, letter to Henry Lee, Sept. 22, 1788, to Benjamin Lincoln, Oct. 26, 1788, and to James Monroe, Feb. 22, 1789.) The first Articles proving inefficient for the accomplishment of the objects of the Union, mainly upon the grounds that they conferred no power upon the central head to regulate commerce with foreign nations, or to act directly upon the citizens of the several States respectively in the collection of the quotas levied upon the States to meet the public expenditures and to sustain the public credit, etc., the Congress, being urged by appeals from several quarters, took up the subject of amendment and general revision on Feb. 21, 1787, and then came to the following resolution upon it:

"*Resolved*, That, in the opinion of Congress, it is expedient that, on the second Monday in May next, a convention of delegates, who shall have been appointed by the several States, be held at Philadelphia, 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 in Congress and confirmed by the States, render the Federal Constitution adequate to the exigencies of government and the preservation of the Union." See Elliot's *Debates on the Federal Constitution*, vol. i., p. 120.

It was under this resolution of Congress, and in response to it by eleven of the States in choosing and sending delegates, that the ever-memorable Federal Convention assembled in Philadelphia, May 14, 1787. Each of the old thirteen States then composing the Union was represented in it, except Rhode Island. George Washington, almost universally styled the "Father of his Country," was unanimously chosen president of the convention. As a whole, it was unquestionably the ablest body of jurists, legislators, and statesmen that had ever assembled on the continent of North America. The convention remained in session from May 14 till Sept. 17 ensuing. Their deliberations and proceedings were with closed doors. The journal of these proceedings was not published until over forty years afterward. The actual and practical result, however, of their labors in the execution of the high trust committed to them was immediately communicated to Congress, and, being approved by that body, was speedily communicated to the respective States. This was their grand work in framing and proposing that matchless system of federal government set forth and embodied in the new Constitution for the government of the U. S. of America, which was adopted and ratified by eleven States before the close of the year 1788; so that it went into operation between the States ratifying at the time appointed in 1789. The other two, North Carolina and Rhode Island, adopted and ratified it in less than two years afterward. The last of the old thirteen which came into the Union, so remodeled in its federal structure, was Rhode Island. Several features in this new form and constitution of government for separate States and communities are without a parallel in ancient or modern times. It was in contemplation of one of these peculiar features that De Tocqueville, an authority thoroughly versed in the science of politics, made the following commentary: "This Constitution, which may at first be confounded with the federal constitutions which have preceded it, rests, in truth, upon a wholly novel theory, which may be considered as a great discovery in modern political science. In all the confederations which preceded the American Constitution of 1789 the allied States, for a common object, agreed to obey the injunctions of a federal government, but they reserved to themselves the right of ordaining and enforcing the laws of the Union. The American States which combined in 1789 agreed that the federal government should not only dictate, but should execute, its own enactments. In both cases the right is the same, but the exercise of the right is different, and this difference produced the most momentous consequences." See De Tocqueville's *Democracy in America*, vol. i., p. 198.

As to how far under the Constitution the Federal Government had a right to coerce a State was not so clearly stated in the Constitution as to afford a guaranty against future disputes. Important questions of interpretations on this subject arose in the early history of the Government. During the first half century the New England States, in consequence of dissatisfaction with the course of the Federal Government, asserted the right to nullify the acts of Con-

gress, and similar ground was taken by South Carolina a few years later. This important question was the occasion of the most momentous debate ever held in the history of the Government. Senators Hayne and Calhoun took the one side and Daniel Webster the other. The views of Webster came to be generally held in the North, while the South maintained those of Hayne and Calhoun with similar tenacity. But the question involved too many interests to be settled by discussion alone, and it thus became what may be called the Constitutional occasion of the civil war.

Revised by C. K. Adams.

The following is the text of the new Constitution proposed by the convention of 1787, and adopted by a number of the States sufficient for it to go into operation in 1789, beginning with the preamble and ending with the last of the Amendments:

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 three, Massachusetts eight, Rhode Island and Providence Plantations one, Connecticut five, New York six, New Jersey four, Pennsylvania eight, Delaware one, Maryland six, Virginia ten, North Carolina five, South Carolina five, and Georgia three.

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 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 session 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 session 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 becomes 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 excises 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 a 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 10 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, dockyards, 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 the 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 impost 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 this 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 enter 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 grant-

* This mode of election of President and Vice-President has been modified by the Twelfth Amendment, *post*.

ing 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 case of disagreement between them, with respect to the time of the 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 of 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 can not 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 seventeenth 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. In witness whereof we have hereunto subscribed our names.

GEO. WASHINGTON,
Presid't, and Deputy from Virginia.

NEW HAMPSHIRE.
John Langdon,
Nicholas Gilman.

MASSACHUSETTS.
Nathaniel Gorham,
Rufus King.

CONNECTICUT.
Wm. Saml. Johnson,
Roger Sherman.

NEW YORK.
Alexander Hamilton.

NEW JERSEY.
Wil. Livingston,
David Brearley,
Wm. Paterson,
Jona. Dayton.

PENNSYLVANIA.
B. Franklin,
Thomas Mifflin,
Robt. Morris,
Geo. Clymer,
Tho. Fitzsimons,
Jared Ingersoll,
James Wilson,
Gouv. Morris.

DELAWARE.
Geo. Read.
Gunning Bedford, Jr.,
John Dickinson,
Richard Bassett,
Jaco: Broom.

MARYLAND.
James M'Henry,
Dan. of St. Thomas Jenifer,
Dan. Carroll.

VIRGINIA.
John Blair,
James Madison, Jr.

NORTH CAROLINA.
Wm. Blount,
Rich. Dobbs Spaight,
Hu. Williamson.

SOUTH CAROLINA.
J. Rutledge,
Charles Cotesworth Pinckney,
Charles Pinckney,
Pierce Butler.

GEORGIA.
William Few,
Abr. Baldwin.

Attest:
WILLIAM JACKSON, *Secretary.*

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 quar-

* Articles I. to X., inclusive, were proposed by the First Congress in 1789-90, Article XI. in 1793, Article XII. in 1803, Article XIII. in 1865, Article XIV. in 1868, and Article XV. in 1870.

tered 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 to 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 accusation; 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 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 proportion 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.

See CONSTITUTION.

Constitutions of Clarendon: See CLARENDON.

Construction [from Lat. *construc'tio*; *con*, together + *stru'ere*, build]: the act of building; fabrication; structure; the mode of putting together the parts of a building or system. In grammar, it signifies syntax, or the arrangement and connection of words in a sentence; their meaning or interpretation. In architecture and engineering, construction is that branch of the science which relates to the practical execution of the works required to realize the artist's design; it is immediately connected with the distribution of the different forces, the strains of the parts and materials of a building, and the properties of the various materials used.

Construction (in law): See INTERPRETATION.

Consubstantiation [from Lat. *con*, together, like + *substan'tia*, being, substance]: the transformation, transition, or union of substances originally distinct into a common substance—substantial conjunction; a term used in antithesis to TRANSUBSTANTIATION (*q. v.*), which means the transition of one substance into another, either by transmutation or by annihilation and substitution—one substance *in*

place of two; while consubstantiation results in one substance *out of* two. The term consubstantiation has been used in the controversies on the REAL PRESENCE (*q. v.*), the mode of the presence of the body and blood of Christ in the EUCHARIST (*q. v.*). The theories of presence may be thus classified:

I. SUBJECTIVE: 1. Natural—Zwingli.

2. Supernatural—Calvin.

II. OBJECTIVE: 1. *Monistic*; *one* substance only really present; the body and blood: Roman Catholic *transubstantiation.*

2. *Dualistic*; the two substances really present—bread and wine, body and blood.

a. Substantial conjunction of the two—consubstantiation, IMPANATION (*q. v.*), as held by John of Paris and Rupert; falsely charged on the Lutheran Church.

b. Sacramental conjunction—mystical mediating relation of the natural (bread and wine) to the supernatural (body and blood), each unchanged in its substance, and without substantial conjunction; the *Lutheran* view.

This tabular view at once accounts for the fact that the charge of holding this doctrine has been so commonly made against the Lutheran Church, and shows how groundless the charge is. (See Krauth's *Conservative Reformation*, 757–775.) The same charge, with an equal want of accuracy, has been made against Dr. Pusey and his school.

Consul [Lat., of uncertain etymology, but most probable is derivation from a subst. **cōnsā*, corporation: Goth. *hansa*, Mod. Germ. *Hanse.* Other attempts at explanation connect it with *consu'lere*, or with *con* + *sede're*]: the supreme magistrate of ancient Rome after the expulsion of the kings. The number was two, and the period of office one year, but there was no restriction as to the number of times the same individual might be elected, although a certain interval was at length required before again holding the office. Consuls were the supreme executive officers, but had no legislative authority. They were originally chosen only from the patricians, but afterward from the plebeians also. The age required by law was forty-three years, but besides this it was requisite to have passed through the inferior offices of quæstor, ædile, and prætor. They were elected at the *comitia centuriata* some months before their entrance into office, which took place at different periods of the year at different times, but finally in January. During the interval they were termed *consules designati*, or "consuls elect." Soon after the entrance into office they cast lots for the provinces to fall to the share of each, the superintendence of which was conferred on them by the senate. Under the emperors the nominal office of the consulate was preserved, but its substantial power destroyed; the elections became mere forms, the emperor appointing whom he pleased. Then, too, the custom was introduced of having several sets of consuls in one year; those admitted on the first day gave their name to the year, and were distinguished from the others, who were termed *suffecti* (substituted), by the title *ordinarii* (regular). Persons also were sometimes dignified with the title without enjoying the office, and were then styled *honorary consuls.* Under Justinian the year ceased to be called by the name of the consul.

Consuls in French history were the persons to whom, after the dissolution of the Directory in Nov., 1799, was intrusted the provisional government of the country. According to the constitution thus framed, Bonaparte, Cambacérès, and Lebrun, called first, second, and third consuls, were elected at the same time by the conservative senate, each for ten years, and invested with different degrees of authority. But the senate having passed various decrees which curtailed the powers of the second and third consuls, and augmented those of the first, the government was gradually assimilated to a monarchy, and after the lapse of four years and a half an easy transition was made from the consular to the imperial form; the title of emperor was substituted for that of consul, and the exercise of the sovereign authority was delegated exclusively to Napoleon Bonaparte.

Consuls: agents clothed with no diplomatic or political power, residing in a certain district in order to protect the interests, chiefly commercial, of the country which commissions them. Their special duties are determined by their own government, and they receive a permission to perform their duties from the foreign authorities. This is called an *exequatur*, and may be withdrawn for reasons judged sufficient by the same authorities. Consuls have no exterritoriality unless by special treaty, but are subject to the laws of the country where they reside. A gross insult to the consular flag would be a ground of complaint, and so an insult to the consul's person might be resented as an insult to his country, but in general, and where his representative character is not attacked, he is like other men in his privileges. He may engage in business; he need not be the subject of the country commissioning him; he may even be a citizen of the state in which he serves. This will all be determined by the laws of each country for itself.

The office of consul bears some analogy to that of the *proxenus* in Greek states, whose business it was to aid the citizens and pay attention to the envoys of the city which appointed them. They were, however, always citizens of the place where they acted as *proxeni*, and the office, which was an extension of the relation between host and guest, remained in the same family. But the true origin of the consul, in the modern acceptation of the word, is to be traced to the times when commerce began to be active in the Middle Ages. The merchants of the cities on the Mediterranean had already officers who were called by this name, and who settled disputes that arose in the course of business. It was a short step, when bodies of merchants from the same place went for business purposes to the eastern parts of the Mediterranean, that a consul should go out with them or should be sent to live among them, invested with similar powers.

Besides judging the disputes of their countrymen, their residences and warehouses, having an exterritorial character, served as places of safe deposit for their fellow-citizens' goods during the frequent wars. But as resident ambassadors became common, the exterritorial privileges of consuls were largely withdrawn, and their importance declined, except in certain semi-civilized states.

Modern consuls are divided into classes, differing somewhat in different states. There are consuls-general and consuls, vice-consuls and deputy-consuls, consular and commercial agents. The first have in charge the consular service in an entire country. They may unite a diplomatic with the consular character. Consuls will usually report through their consul-general, though not really dependent upon him. A vice-consul will fill the consul's place during his absences. He is usually nominated by him, while in the U. S. consuls are appointed by the President and confirmed by the Senate. By the usage of the U. S. commercial and consular agents are distinguished according to their uses, the former being rather agents of the executive, sent abroad for special purposes, and needing no *exequatur*. The classes of consuls employed by the U. S. and their duties are fully described in the *United States Consular Regulations*, and in a handbook for the use of consuls in the U. S., 1870.

Duties of Consuls.—These depend upon treaty, usage, and statute. In general they relate to the issuing of passports; the authentication of documents; the care of their countrymen's property, particularly in case of death or shipwreck; the certification of births, marriages, and deaths; the arbitration (voluntary) of disputes, as between master and crew; the relief of destitute seamen; the control of their country's shipping; an examination of their country's trade, with suggestions for its increase; in fine, a general care over the rights and interests of their countrymen, so far as they lie within their districts, to secure their just treatment by the foreign government. One provision of U. S. law may be mentioned. By the act of June 22, 1860, all marriages in the presence of any consular officer in a foreign country, between persons who would be authorized to marry if residing in the District of Columbia, shall have the same validity as if the marriage had been solemnized in the U. S. The officer is directed to give to each of the parties a certificate of marriage, stating their names, ages, places of birth, and residence, and to forward a duplicate to the department of State at Washington.

Exterritorial Rights of Consuls in Oriental Countries.—These depend solely upon treaty stipulations, and are not reciprocal. They are based upon the belief that in the laws and judicial procedure of certain countries resident foreigners can not find a guaranty for the protection of person and property. If such a country comes under the control of another state which *can* give such guaranty, as when Algiers became French territory, these privileges disappear. The same should be true when a country like Japan by its change of law and growth in civilization can secure to the resident foreigner protection and justice.

Since resident foreigners in such countries are exempt from the native law, and since they must be under some law, jurisdiction over them is granted by treaty and statute to their diplomatic and consular officers sitting as judges in

consular courts. The system of the U. S. is a fair illustration.

Under U. S. statutes of Aug. 11, 1848, and June 22, 1850, jurisdiction is granted diplomatic and consular officers, where authorized by treaty, to be exercised in conformity "with the laws of the U. S.; with the common law, including equity and admiralty"; and with certain diplomatic regulations. The consuls have exclusive jurisdiction in minor criminal cases, and in civil cases involving $500 or under. Appeal may be taken to the minister resident, and to the circuit court in California. In capital cases the consul summons four associates, his countrymen, to sit with him; their verdict must be approved by the minister to secure conviction. The question of how cases between citizens of the U. S. and natives shall be tried is settled in Art. IV. of the treaty of 1857 between Japan and the U. S., which provides that citizens of the U. S. committing offenses in Japan shall be tried by the U. S. consul-general or consul, and shall be punished according to U. S. laws. Japanese committing offenses against citizens of the U. S. shall be tried by the Japanese authorities, and punished according to Japanese laws. Thus the case is tried in the court of the defendant. Where the parties to a suit are a U. S. citizen and a foreigner, the case is tried in accordance with the special rules existing between the U. S. and the state to which that foreigner belongs.

Much complaint has been made of this system of consular jurisdiction, and amendments to it suggested. The mixed courts in Egypt, consisting of two bodies, their members both natives and foreigners, present another and different example of exterritorial judicial privileges.

Foreign Consuls in the U. S.—The U. S. Circuit and Supreme Courts have original jurisdiction in all cases affecting foreign consuls, who may, however, enter State courts as plaintiffs, but with the right of appeal to the U. S. court at any stage of the case. They may also defend the property rights of their countrymen before U. S. courts. Foreign consuls are not excused from the duty of acting as witnesses before U. S. courts, except under treaty, and it is not the policy of the U. S. to grant such exemption.

Revised by T. S. Woolsey.

Consumers' Co-operation: See Co-operation.

Consumption [from Lat. *consum'ptio*, the wearing away; *con*, altogether + *su'mere*, take]: the popular name for tuberculosis of the lungs or *phthisis pulmonalis*. This disease, which carries off one in every seven human beings, though studied with the greatest attention and care from the earliest days of scientific medicine, was little understood until the present century, and served as the occasion of the most active controversies and as the basis of conflicting schools of pathology until the most recent years. The general manifestations of the disease, its clinical aspects, had been well enough studied, but of the nature of changes in the lungs nothing but the most vague and erroneous ideas had been formed, until in 1794 Baillie called attention to the little nodules in the lungs, formations which are now called tubercles. Closely following this observer, Boyle (1810) still further described these nodules, though perhaps not with as much accuracy as his predecessor, and after these pioneers many others investigated the disease from the same standpoint of structural changes. The results achieved were, however, far short of the meed of the labor, and, with the exception of Laennec, who was in these studies led to found the science of physical diagnosis (see Auscultation and Percussion), few of the observers added much to lasting knowledge. The error of this early pathology lay in the confusing and inaccurate nomenclature, and in ascribing to one of the more or less unessential elements in the structural changes (the cheesy necrosis of the tubercles) the principal *rôle* in the disease. Nothing of any moment was now added to our knowledge of phthisis until the introduction of Virchow's cellular pathology. This investigator finally described the minute structure of the small nodule or tubercle which forms the essential element in the morbid anatomy of the disease, and thereby laid the foundation on which rest all of our present conceptions. The problem of phthisis seemed now to be solved, but there yet remained the more important question of the cause, and this, too, has at length been determined. The most important contribution to the new science of Bacteriology (*q. v.*) that has thus far been made was unquestionably the demonstration by Koch of the tubercle bacillus. The magnitude of his announcement of necessity called forth the liveliest opposition, but Koch's investigations have now been so often repeated, and with such uniformly convincing results, that it may be stated absolutely that the bacillus is not alone the accompaniment but also the cause of the disease. With this knowledge much may be hoped and expected in the way of prevention and of cure; without it aims in this direction must have remained as before, uncertain and empirical. The tubercle bacillus is a minute microscopical organism which occurs abundantly in the expectoration of consumptives, and may gain access to the air by the drying of this and the subsequent dissemination as dust. This fact has been determined not alone by theoretical reasoning, but by actual observation by Cornet, who found the bacilli abundant in the air of hospital wards in which lay cases of phthisis; more sparingly in other wards, and least of all in rooms to which consumptives had no access. The obvious lesson taught by this observation is that in cases of phthisis every precaution should be taken to insure the destruction of the bacilli in the sputum, and, above all, to prevent the drying of this upon carpets, floors, etc., whence the germs are readily spread through the air. Long before the discovery or even suspicion of the existence of the tubercle bacillus, accurate observers had noted cases which seemed to prove direct contagiousness of tuberculosis, as from husband to wife, parent to child, and the like, but no rational plan of prevention could be formed until the nature of the germ had been made known.

Once introduced into the lungs, the bacillus sets up by its direct action or by operation of poisons generated in its growth the inflammatory changes constituting the disease phthisis. These consist mainly in the formation of small grayish nodules, the tubercles, which show a marked tendency to degenerative change, whereby cheesy masses, formerly considered so essential, result. In the further progress of the case two classes of changes may follow, the unfavorable, when the destruction of tissue advances, with breaking down and liquefaction of the nodules, cavities resulting; or the more favorable, when a capsule of fibrous tissues surrounds the nodule, which itself may or may not become infiltrated with calcareous matter, the result in this case being a more or less complete cessation of the disease.

The symptoms of the disease are very obscure in the early stages, but generally begin with slight cough of a dry, hacking nature, lassitude, and tendency to flushing or fever. Following these come the more pronounced signs: excessive cough with yellowish expectoration; hectic fever, the temperature becoming elevated in the afternoon or evening, and the cheeks presenting the characteristic spots of redness; drenching night-sweats and progressive weakness and wasting. It is this type of disease to which the popular term "decline" has been aptly applied. In the further progress of the case intensification of the above symptoms is noted, and in addition there may be obstinate and debilitating diarrhœa and the much-dreaded hæmorrhages. The latter are due to ulceration of the blood-vessels within the lungs, usually in the walls of cavities. They may be very copious, and death may be directly due to loss of blood, though such a result is comparatively rare. In spite of this most pitiable condition, however, the patient generally continues serene and hopeful, and the mind remarkably clear and active.

The recognition of the disease in its earliest stages is of the utmost importance, and often taxes the most experienced physician. Much may be assumed from the general appearance and previous health of the patient. It is unquestionably true that certain persons are peculiarly liable to tuberculosis, and it is this liability which is transmitted from parent to offspring. The possibility of direct transmission of the disease is still an open question, though the weight of authority inclines to such a belief. Those of tuberculous or scrofulous habit are generally spare, long limbed, with narrow chests, large joints, dark hair and eyes, sallow complexion, and a tendency to bronchitis on slight exposure. In such persons, and to a less degree in others, any unusual fatigue, illness or exposure may so depress the general vitality that infection is apt to occur, the immediate cause of the disease in all cases being entrance of the specific organism. Besides these there is a variety of other conditions which predispose to the disease. Thus it was found by Bowditch and others that phthisis is apt to prevail where the air and soil are charged with moisture, as in houses densely shaded by trees or the like. Climate and race are likewise of importance. In America the Negro is especially prone, probably owing to various causes: bad hygiene, improper food, as well as special liability. Particular occupations predispose, especially such as occasion constant in-

halation of small particles, as of iron in steel grinders, coal in miners, clay in potters, etc. Finally, phthisis is a not uncommon sequel of certain debilitating diseases in which there is generally also bronchitis, such as measles, whooping cough, and typhoid fever.

The treatment of consumption is of greatest importance in the first stages, before serious and unremediable destruction has occurred, and it is of vital importance to recognize the earliest symptoms. Of far greater import and promise, however, is the prevention of the disease. Those of scrofulous habit or of tuberculous parentage must at all times guard against unnecessary exposure or fatigue; they should follow a regular plan of life, in work, diet, recreation, sleep, and exercise, and should, above all, use the greatest care in preventing attacks of bronchitis, and in caring for such when they do occur. Regulated and especially pulmonary exercise will in many cases serve to develop a body far from healthy to a fair state of tolerance of exposure, and doubtless if generally observed would reduce the number of cases very materially. Once the actual onset of the disease is noted the treatment must be active, for recent observation would indicate that much may be hoped for in the early stages, whereas it is well known that little can be done in its subsequent course. The numerous observations at autopsies of localized and healed tubercular lesions at the summit of the lung, where the process generally begins, are convincing proof of the curability of the disease had we but the power of recognizing the very earliest manifestations. In these early cases no treatment compares with the hygienic and climatic. (See CLIMATE.) In the selection of a climate adapted to a particular case many elements enter into consideration. Thus the stage of the disease; its evident character, whether slow or rapid, with much or little cough and expectoration; the condition of the general health, of the heart, the nervous system, etc., all must be carefully weighed, and, above all, care must be had that the patient is not hastily sent away to strange places, among strange people, utterly alone, a prey to all manner of fears and depressing mental conditions. The cool, dry, and bracing air of Colorado may serve one, the more equable climate of Southern California another, while a third is best suited in the dry regions of New Mexico. The advantages of such warm, moist climates as Florida are palliative rather than curative, and serve the purpose of rendering the last days of life as painless as possible, by checking excessive cough or restlessness and the like.

Of the drug treatment very little need be said. Tonics, such as cod-liver oil, iron, and whisky or brandy; remedies to reduce excessive cough and favor expectoration; others to prevent the debilitating sweats and diarrhœa, with any other medication that may be called for by the various symptoms of different cases, form the most important part of the treatment by drugs.

A recent plan of treatment, suggested by Koch, the discoverer of the bacillus, consists in the injection of dilute solutions of a glycerin extract of the bacillus itself. This plan of treatment has been extensively used, but offers no hope in its present method of application, and is not free from the danger of causing a rapid dissemination of the tubercular disease throughout the body; that is, general tuberculosis. In certain forms of external tuberculosis affecting the skin, bones, and joints, some good seems to have been achieved. There is still much to learn regarding the action of products of the growth of the bacillus, and there is great reason to expect much from protective inoculation.

WILLIAM PEPPER.

Contagion [from Lat. *contā'gio*; *con*, together + a form of root *tag-*; cf. *tan'gere*, touch, *taxa're*, attack, *contāmina're*, *tactus*, etc.]: the communication of disease from one person or brute to another by contact, direct or indirect. See EPIDEMIC, INFECTIOUS DISEASES, and BACTERIOLOGY.

Contarini, kōn-tăă-ree'nĕĕ: the name of a noble family of Venice that produced numerous doges, senators, generals, artists, and authors. The most famous were—AMBROGIO, a senator, who was sent as ambassador to the King of Persia in 1473. He returned in 1477, and published in 1487 a curious account of his mission and travels.—ANDREA, elected doge in 1367. He gained in 1380 an important victory over the Genoese, and saved Venice from imminent danger. Died in 1382.—DOMENICO, elected doge in 1659; waged war against the Turks, who took Candia in 1667 after a famous siege. Died in 1674.—GASPARO, a cardinal and writer; was born at Venice in 1483. He was sent as ambassador to the court of Charles V., and was papal legate at the Diet of Ratisbon in 1541. Died in 1542.

Contempt [from Lat. *contemptus*, indifference; deriv. of *contem'nere contemptus*, despise]: in law, a willful disregard or disobedience of a public authority.

Contempt of Legislature.—By the Constitution of the U. S. each house of Congress may punish its members for disorderly behavior, and with the concurrence of two-thirds expel a member. The power to punish for contempt is also possessed by either house of Congress, as incidental to the complete exercise of the authority granted by the Constitution, and extends to strangers or persons who are not members. This power of punishing for contempt must be exercised during the session of Congress, and the punishment itself can not extend beyond the existence of the Congress. The power of the British Parliament to punish for contempt rests upon principles peculiar to it, and not upon any general rule applicable to all legislative bodies. Before its separation into two houses Parliament was a high court of judicature, and possessed of the general power incident to such a court of punishing for contempt. After its separation into two houses, both the House of Lords and the House of Commons retained the power of punishing for contempt, as each was regarded as a court of judicature. In the U. S. neither house of Congress ever constituted a part of any court of general jurisdiction. The power of either house must be found in some express grant in the Constitution, or be found necessary to carry into effect such powers as are therein granted; so that the power of either house of Congress to punish for contempt can exist in no case when the house attempting to exercise it invokes its aid in a matter to which its authority does not extend. The power of punishing for contempt does not under any circumstances belong to inferior legislative bodies, such as the common councils of cities.

Contempt of Court.—Courts of justice have an inherent power to punish all persons for contempt of their rules and orders, for disobedience of process, and for disturbing them in their proceedings. Disobedience of the order of a court which had no jurisdiction is not a contempt. A court will of its own motion notice and summarily punish a contempt committed in its presence, but contempts not so committed must be usually brought before it by affidavits, and the offender is ordered to show cause why an attachment should not issue against him, or a rule is made directing him to appear and answer. He has no right in such cases to a trial by jury. The penalty for contempt is usually fine or imprisonment. All courts of record possess the power to punish for contempt. In Great Britain and in some of the U. S. justices of the peace can punish summarily contempt committed in their presence, while in other States they can only bind the offender over and compel him to find sureties for his good behavior.

When a person is regularly adjudged to be in contempt he can not be discharged by another court or judge on a writ of *habeas corpus*. In some of the U. S. the law of contempt is carefully regulated by statute.

HENRY WADE ROGERS.

Conti, kōn'tee', ARMAND DE BOURBON, Prince de: b. in Paris in 1629; brother of the great Prince of Condé and a son of Henry II., Prince de Condé, and Charlotte of Montmorency. He studied at the Sorbonne, being designed for the Church, but did not take orders. In the civil war of the Fronde he commanded a royalist army against the Prince of Condé. He married a niece of Cardinal Mazarin. He wrote several tracts, one of which was directed against stage plays. D. in 1666.

Conti, FRANÇOIS LOUIS DE BOURBON, Prince de: French general; son of the preceding; b. in Paris in 1664. He had so high a reputation for valor and other popular qualities that he was chosen King of Poland by a large party in 1697, but Augustus of Saxony obtained the throne. He served with distinction at Steenkerke in 1698, and received the command of an army in Flanders in 1709, but died Feb. 22 of the same year. According to Saint-Simon he was the "idol of the soldiers and the hero of the officers." See Saint-Simon, *Mémoires*.

Contiguity, Law of: See ASSOCIATION OF IDEAS.

Continent [from Lat. *continens*, continuous, uninterrupted, continent (sc. *terra*); *con*, together + *tene're*, hold]: a natural division of land larger than an island. Modern usage recognizes four continents—Eurasia, Africa, North

America, and South America—and is divided as regards Australia, which is variously styled a continent and a continental island. The title Antarctic Continent is sometimes given to a great body of land supposed to occupy the south polar region. Formerly Europe and Asia were accounted as two continents.

Each of the Americas is characterized by a lofty mountainous belt along its western border and by great plains extending thence with little interruption to its eastern coast. Each is also somewhat triangular in outline, with an angle toward the S. These resemblances have led to much search for homologies in the configuration of continents, but without valuable result. More fruitful inquiries have been prosecuted by the aid of the plummet and dredge in oceanic depths, which are the complement of continental heights. It is found that the gentler slopes of continental surfaces are continued under water about many coasts, constituting shoals, and that from the edges of these shoals or "continental shelves" there is rapid descent to depths much greater. It is found, moreover, that the detritus carried from the land by rivers covers the ocean bottom only near coasts, that the sediments of the deeper parts of the ocean are of an entirely different character (see Ocean), and that the upraised sediments studied by geologists are of the coastal and not of the pelagic type. From these facts it is inferred that the continental plateaus of the earth, including the continents and continental shelves, have had their present positions and extent from the remotest geologic times, and that the ocean depths are equally permanent. If this view is correct, the complex series of changes in the distribution of land and water demonstrated by geologic phenomena have been restricted to the continental plateaus, and the geologic record of earth's history is less fragmentary than has been supposed. See the article Geology, and also the contour map of land height and ocean depth illustrating the article Earth.

The following tables of continental dimensions and drainage areas are based on estimates by Murray (*Scottish Geog. Mag.*, vols. ii. and iv.). In the tables Eurasia includes the British, Baltic, and Mediterranean islands, and Ceylon; North America includes Newfoundland, the Aleutian islands, and the Arctic islands W. of Greenland; and South America includes Terra del Fuego and the Falkland islands:

TABLE OF CONTINENTAL HEIGHTS.

CONTINENT.	PERCENTAGE OF AREA—			Mean height, in feet.
	Below 3,000 feet.	Between 3,000 and 12,000 feet.	Above 12,000 feet.	
Eurasia	67·8	27·3	4·9	2,450
Africa	75·2	24·6	0·2	1,750
North America	77·8	21·8	0·4	1,650
South America	83·4	12·1	4·5	1,850
Australia	98·1	1·9	...	700

TABLE OF CONTINENTAL DRAINAGE DISTRICTS.

DRAINAGE DISTRICTS.	AREAS OF DRAINAGE DISTRICTS, IN THOUSANDS OF SQUARE MILES.				
	Eurasia.	Africa.	North America.	South America.	Australia.
To Arctic Ocean	4,796	.....	2,837	.....	.....
To Baltic Sea	612	.....	.....	.....	.....
To Mediterranean Sea	1,421	1,514	.....	.....	.....
To Atlantic Ocean	681	4,104	3,221	6,113	.....
To Pacific Ocean	3,785	.....	1,870	437	300
To Indian Ocean	3,120	2,106	.....	.....	1,158
Inland drainage	5,567	3,561	279	523	1,556
Totals	19,982	11,285	8,207	7,073	3,014

G. K. Gilbert.

Continental [originally used in the U. S. in contradistinction to *provincial*; belonging to the whole North American continent, and not to any one province or colony]: an epithet applied to the money and troops of the revolting colonies during the Revolutionary war. It was introduced in the early part of that contest by the colonists to distinguish their own forces from those of the British Government. The latter were called "ministerial forces," being under the control of the British ministry. The "Continental Congress" was the Congress of the colonies, and after the Declaration of Independence it was the Congress of the U. S. previous to 1788, when the Constitution came into force. It had only one house.

Continental System: Napoleon's policy of excluding from the continent of Europe goods borne in British vessels or in neutral vessels that had touched at British ports. His first attempt to establish this system was by the Berlin decree, Nov. 21, 1806, which prohibited all European countries allied with France from carrying on commerce with Great Britain, or admitting any merchandise that had been produced either in Great Britain or in her colonies. Great Britain retaliated by the Orders in Council of Jan. 7 and Nov. 11, 1807, declaring all harbors and places of France, her colonies and allies, in a state of a blockade; whereupon Napoleon issued a decree at Milan, Dec. 17, 1807, and another at the Tuileries, Jan. 11, 1808, carrying the system a step further. Any ship submitting to search by a British vessel, or sent on a voyage to Great Britain, or paying a duty to the British Government, was declared to be a lawful prize of war. Finally, at Trianon, Aug. 3, 1810, and Fontainebleau, Oct. 18, 1810, the policy was completed, and it was ordered that all British goods when captured should be burned. At the Peace of Tilsit in 1807 the Czar agreed to close the Russian ports. Thus almost the entire continental coast was in a state of blockade, which, though only partially effective, was still sufficient to cause a general depression of trade, and to exasperate the people with Napoleon's rule, especially in Germany. In the large trading centers merchants were subjected to a most galling system of espionage, and their goods were liable at any moment to be seized on suspicion. The policy was not only unjust and oppressive, it was a serious mistake. Russia's abandonment of the system in 1810 was the chief cause of the war between her and France. The war of 1812 between Great Britain and the U. S. was due largely to the former's attempt to enforce her retaliatory Orders in Council. F. M. Colby.

Continued Fraction: one whose numerator is an integer, and whose denominator is an integer plus a fraction repeated in the same way. Thus in the continued fraction

$$3 + \cfrac{1}{7 + \cfrac{1}{15 + \cfrac{1}{1 + \cfrac{1}{25 + \cfrac{1}{1 + \cfrac{1}{7\frac{1}{4}}}}}}}$$

the whole number 3 is followed by a fraction of which the numerator is 1, and the denominator is 7 plus another fraction whose numerator is 1, and whose denominator is 15 plus another fraction, etc.

To convert a proper fraction into a continued fraction, divide the denominator by the numerator, and make of the mixed-number quotient a new denominator to the numerator, 1. Proceed in like manner with the fractional part of this new denominator, and so continue as long as the division leaves a remainder, or as is necessary for the object in view. If the given fractional number is, as in the foregoing case, an improper fraction, it must first be reduced to a mixed number, after which the above rule applies to the fractional part.

Revised by S. Newcomb.

Continuity, Law of: a principle of considerable use in investigating the laws of motion and of change in general, and which may be thus enunciated: *Nothing passes from one state to another without passing through all the intermediate states.* Leibnitz claims the merit of having first made known this law; but, in so far as motion at least is concerned, it is distinctly laid down by Galileo, and ascribed by him to Plato. But, though a perception of its truth seems to have been felt long before, Leibnitz was certainly the first who applied the principle to test the consistency of theories or supposed laws of nature. The argument on which he attempted to establish it *a priori* is that, if any change were to happen without the intervention of time, the thing changed must be in two different conditions at one and the same instant, which is obviously impossible. A remarkable application of the law of continuity was made by John Bernoulli in an *Essay on the Laws and Communication of Motion*, which gained the prize of the Academy of Sciences in Paris (1724), to prove that perfectly hard bodies can not exist, because in the collision of such bodies a finite change of motion must take place in an instant—an event which, by the law now explained, is impossible. This conclusion was objected to by D'Alembert and Maclaurin,

who, on account of it, were disposed to reject the law of continuity altogether; but the difficulty is got over by supposing (which on various grounds is extremely probable) that there is no real contact, and that bodies begin to act on each other when their surfaces, or what seem to be their surfaces, are yet at a distance.

Continuity, Principle of (in mathematics): See PROJECTION.

Continuous Voyages: in international law, voyages by vessels carrying contraband of war or goods intended for a blockaded port, deemed completed though such vessels may have stopped short of the port at which discharge of cargo would be considered unlawful, and transshipped the goods at that point. (See CONTRABAND.) This doctrine was invented by the famous British judge of admiralty, Sir William Scott, to check evasions of the rule of 1756. (See COLONIAL SYSTEM.) When the direct carrying trade between colony and mother country, of a state at war with Great Britain, was forbidden the neutral shipowner, because such trade was opened to him in war time only, he at once began to sail from the colony to one of his own ports and then to the mother country. These considered apart as two voyages were lawful, but the new doctrine pronounced them one continuous voyage, and therefore subject to the provisions of the rule of 1756. The test was this. Has a cargo of goods from a certain colony been added by genuine sale to the common stock in trade of the country, or has it been put through the forms of entry and sale without removing the ultimate intention of transport and delivery at a port of the parent state? Has a link been added to the chain without altering its direction? This question of the intent governing an importation was an exceedingly difficult one, and the decisions of the admiralty courts gave rise to much complaint. The U. S. accepted neither the rule of 1756 nor the doctrine of continuous voyages, but its protests at the time were without result. An explanation of this doctrine would be hardly worth while here but for its new application by U. S. courts during the civil war, 1861–65. It was notorious that a brisk trade had sprung up both at Nassau and at Matamoras, for the purpose of putting goods, contraband and otherwise, into Confederate hands. The main object was to bring goods as near their real ultimate destination as might be, without risk, by sailing for a neutral port. Here the U. S. courts interfered, asking, are these goods to be sold in open market at Nassau or Matamoras, or are they not rather imported with the intent of immediate re-exportation to a Southern port under blockade, which would constitute one continuous voyage? Here again the question of intent was difficult, to be inferred from a dozen different circumstances, the character of the ship's papers, the bills of lading of the cargo, its nature and adaptation to warlike use, and so on. In the case of the Springbok (Blatch. Pr. Ca., 380, 434, and 5 Wall. 1) the ship and cargo were condemned by the district court, the ship released, but the confiscation of the cargo reaffirmed on appeal to the Supreme Court by a bare majority. She was captured 150 miles from Nassau, and the goods plainly intended for the Confederate service formed less than a hundredth part of her cargo. This decision was severely criticized by all the publicists of Europe. But the claims commission under the treaty of Washington decided that no award for damages was due on account of it. During the Crimean war a neutral ship, the Vrow Houwina, loaded with saltpeter, sailed from Lisbon to Hamburg, a neutral port. She was seized on suspicion of carrying contraband, and condemned by an English court on the ground that Hamburg, fully supplied with saltpeter as it was, was not the ultimate destination of the cargo, but that the intention of conveying it overland to Russia was clearly attached to it and must infect it. This was a new application of the doctrine of continuous voyages to prevent evasions of the war right of a belligerent to capture contraband destined for his enemy. So during the civil war in the U. S. goods, in themselves contraband, bound for Matamoras, a Mexican town on the Rio Grande river, and opposite the Texan city of Brownsville, were similarly condemned as being really destined by land carriage for a Confederate point.

In conclusion, it may be said that the doctrine of continuous voyages in the hands of a belligerent, always tempted to stretch his rights of capture, is a dangerous one; that it is based upon a question of intent in importation which is apt to be inferred on insufficient grounds; and that it is contrary to the greater liberty which is and should be given to neutral trade by the policy of the present age. THEODORE S. WOOLSEY.

Contours: lines traced on the surface of the earth at uniform elevations above the mean ocean-level. A contour map showing a number of these lines gives a better absolute idea of the surface of the ground than any other method of representation on a plane. These maps are made for earthwork estimates, railroad surveys, sewerage plans, as well as for the general purposes of topographical representation. Contours are located in the field by a combination of the methods of LEVELING (*q. v.*) and SURVEYING (*q. v.*). M. M.

Cou'traband [from Ital. *contrabbando*, prohibited, illegal, whence also Fr. *contrebande*; Ital. *contra*, against + *bando*, edict: Fr. *ban*, a Germ. loan-word; cf. Engl. *ban*, Germ. *bann*]: in commercial language, goods exported from or imported into a country against its laws. *Contraband of war* are such articles as a belligerent has by the law of nations the right of preventing a neutral from furnishing to his enemy. Articles contraband of war are, in general, those which relate directly to the carrying on of war. To make them liable to capture two facts must be proved: (1) their contraband character; (2) a hostile destination. Thus neither spool cotton bound to an enemy's port nor gunpowder destined for a neutral port would be contraband. As to what articles are in themselves contraband there is as yet no general agreement, belligerents striving to stretch their war rights and neutrals desiring their trade to be as unrestricted as possible. It is therefore useful for states to agree upon a list of contraband articles by formal treaty. The U. S. has in force eleven such treaties, but few are with European powers.

Many articles could never be held to be contraband; many others must always be so considered; there remains a third class which are doubtful, being capable of being made contraband by circumstances. Here, for instance, are naval stores unmanufactured, horses, provisions, money, the machinery of ships, and other like articles. If no treaty determines the character of these, it must be decided by the special circumstances of each case. Thus provisions could be held contraband only when destined for a place whose reduction by famine is attempted. This is provided in the treaty of the U. S. with Salvador of 1870. An article formerly innocent may become contraband by being made capable of new uses—e. g. iron plates, which after ironclads came into use could be made into ship's armor. If an article is one of the chief products of a country, as lumber in Sweden, it is less likely to be considered contraband by the courts. As a fair example of articles which are contraband the list in the treaty made with Italy by the U. S. in 1871 is here given.

The following articles, and no others, shall be considered as contraband:

1. Cannons, mortars, howitzers, swivels, blunderbusses, muskets, fusees, rifles, carbines, pistols, pikes, swords, sabers, lances, spears, halberds, bombs, grenades, powder, matches, balls, and all other things belonging to, and expressly manufactured for, the use of these arms.

2. Infantry belts, implements of war and defensive weapons, clothes cut or made up in a military form and for a military use.

3. Cavalry belts, war saddles, and holsters.

4. And generally all kinds of arms and instruments of iron, steel, brass, and copper, or any other materials, manufactured, prepared, and formed expressly to make war by sea or land.

Ships made ready for war are not here specifically mentioned, though contraband in the highest degree. Of course, the same ship with a man-of-war's crew on board becomes not an article of commerce, but an armed expedition, and the state permitting the equipment would be held responsible for its acts.

The neutral state is not bound to prevent its subjects from trading in contraband articles. The burden of prevention lies on the shoulders of the belligerent who would suffer. Thus the Winchester Arms Company, of New Haven, Conn., supplied Turkey with rifles in the war with Russia, subject to capture on the way by Russian cruisers. Moreover, a belligerent merchantman may buy war material at a neutral port lawfully, as the Chilian steamer Itata did off the harbor of San Diego in 1891. The penalty for carrying contraband is confiscation of the goods first, but also of the ship if under the same ownership. Goods not contraband are not infected unless collusion or fraud is shown connecting them with the transaction. This penalty may attach at the outset of the voyage, if the ship's papers or the ab-

sence of them or other suspicious circumstance may warrant. And the doctrine of continuous voyages may be applied, so that a nominal neutral destination does not shelter goods. In the case of the Vrow Houwina during the Crimean war, the cargo of saltpeter was confiscated, though bound for Hamburg, a neutral port, since eventual transport overland to Russia was inferred by the court. See CONTINUOUS VOYAGES.

Carrying Dispatches.—These are commonly classed under the head of contraband. By hostile dispatches is not meant the correspondence of a belligerent in the ordinary mails. Mail-bags are sometimes especially exempted from search, as in a treaty between France and Great Britain to govern the Dover and Calais postal service. The same principle was adopted by the U. S. in the latter part of the civil war. But where a neutral ship acts as a dispatch-boat for one belligerent, carrying military orders it may be which might otherwise be prevented, or serving to unite the scattered portions of a fleet, it so identifies itself with that belligerent as to give the other the right to confiscate it.

In this connection may be cited the famous Trent affair of Nov., 1861. The Trent was a neutral mail-steamer sailing between two neutral points. Mason and Slidell, agents of the Confederate Government, though having no recognized diplomatic character, ran the blockade and took passage in her. She was stopped and searched by a U. S. man-of-war, and Messrs. Mason and Slidell were extracted and lodged in a Northern prison. Mr. Seward defended this high-handed act, though asserting that it had not been authorized, under the plea that the Confederate agents were contraband and equivalent to dispatches. Because Capt. Wilkes had released the Trent, thus failing to have her character passed upon by a prize court, Mr. Seward surrendered the prisoners. In fact, the search was lawful, but the arrest unlawful. Persons are not dispatches. The Trent was pursuing her route as a mail-steamer. She was in no sense a dispatch-boat. These persons could not be contraband, having neither a contraband character nor a hostile destination.

Again, if a neutral ship takes on the character of a transport by carrying troops or seamen for either belligerent, it is liable to confiscation.

The class of articles of doubtful character which may or may not be contraband has been mentioned. The right to declare such articles confiscable is called the doctrine of *occasional contraband*. It is a great hardship to the neutral, since he can not certainly know in what he may lawfully trade, and he has never accepted the theory unless through superior force. Thus in the wars with Napoleon when Great Britain made provisions destined for a French port contraband, the U. S., whose trade was largely in breadstuffs, consistently protested, except in one treaty. This has led to a softening of the rigor of the rule called *pre-emption*. This was the purchase at a fixed rate, none too high, of goods of doubtful character instead of their confiscation. If the doctrine of occasional contraband is illegal, pre-emption also falls to the ground, for the one is but a corollary to the other.

Revised by T. S. WOOLSEY.

Contrabands: fugitive Negro slaves received and retained by the Union army during the civil war in the U. S. in 1861–65. The name originated from Gen. Butler. The day after his arrival at Fort Monroe a sally was made into Hampton, and three Negroes held as slaves by Col. Mallory of that place escaped into the Union lines. They were brought before Gen. Butler, who was very much in need of laborers for field-works he was about to construct. When asked what he would do with the runaways, he answered, "Keep them as contrabands."

Con'tract [from Lat. *contrac'tus*, agreement, a drawing together; *con*, together + *tra'here*, *trac'tus*, draw]: an agreement in which a party undertakes to do or not to do a particular thing. Contracts are distinguished according to their form, either as contracts of record, specialties, or simple contracts. Contracts of record are such obligations as are evidenced by judicial records, as, for example, recognizances and judgments. (See these titles severally.) Specialties are contracts under seal, such as deeds, bonds, and covenants. Simple or parol contracts include those agreements which are not comprised within the first two classes, and may be either oral or in writing. As regards the mode of their creation, contracts are further distinguished as express or implied. They are express when stated by the parties thereto consenting in direct and formal terms; implied, when they derive their origin and validity from construction of law, as being of such a nature that reason and justice dictate their fulfillment. Contracts are still differently classified in reference to the time of their performance, as executed and executory. They are said to be executed when the obligations therein created have been already carried out; executory, when their fulfillment is yet to be accomplished. Contracts of every variety include four essential constituent elements: First, there must be competent parties; second, there must be mutual consent to the terms of the agreement; third, there must be a valid consideration, either actual or presumed; and, fourth, there must be a definite and legal subject-matter to be acted upon. As regards the first point, all persons are capable of binding themselves by their contracts except certain important classes of individuals who labor under some natural infirmity, either from want of sufficient age (as infants), or from lack of requisite mental soundness (as idiots and lunatics), or who are placed arbitrarily under disability in consequence of their legal status (as married women). Drunkards, seamen, aliens, and bankrupts are also incapacitated in certain instances. Infancy at law is the condition of persons under the age of twenty-one, though in some States women become of age at eighteen. It is a general principle, though subject to exceptions, in accordance with modern judicial decisions, that an infant's contracts are not void, but voidable; i. e. they may be confirmed or disavowed by him at his option. Disaffirmance, in general, may take place either before majority, or within a reasonable time afterward; confirmation, only after majority. The chief important exception to this rule is an infant's contracts for necessaries, which are considered binding upon him. The term "necessaries" comprises different articles according to the wealth and station of the infant. The validity of these obligations is established for the same reason that others are considered voidable—that the infant's welfare may be insured until he arrives at years of discretion. Moreover, the contract of marriage may be entered into by males at the age of fourteen, and by females at the age of twelve, unless there is some statutory provision to the contrary; but an infant's contract to marry is voidable. Idiots and lunatics are relieved from responsibility for their contracts, because they are incapable of understanding the nature of the promises they make, and of giving a valid assent. But it is likewise true of them, as of infants, that contracts for necessaries suitable to their station, if entered into with other parties who act in good faith, are obligatory. Insane persons may also have lucid intervals, and would be liable for agreements made under such circumstances. Temporary mental weakness resulting from intoxication will relieve from liability when it is sufficient in degree to preclude reasonable action. Mere mental feebleness, however originating, which is not so excessive as to prevent a comprehension of the nature of a contract, will be no ground of exemption unless a person affected by it is led into a contract by imposition. Married women, at common law, are placed under an almost entire inability to contract. Their legal existence is deemed to be merged in that of their husbands. In some instances they have power to bind their husbands, as when they act as agents or make engagements for necessaries which their husbands refuse to supply; but agreements of this kind are not their own personal obligations. Courts of equity and recent statutory provisions have considerably extended the powers of married women to enter into engagements which will be binding upon their property, and the tendency of modern legislation is to give married women the same power to contract that single women have. This result in equity has been accomplished through the medium of trusts. The incapacity of aliens extends mainly to their ability to acquire a valid title to real estate, and in some States has been removed. Seamen are relieved, in certain instances, from their stipulations, to protect them from the consequences of their own improvidence; while the engagements of bankrupts are in some instances nullified to prevent injury to their creditors. Persons who are forced into contracts by duress, either through imprisonment or reasonable fear of injury to life or limb, or by abuse of legal process, are excused from their fulfillment.

As regards the nature of the obligations which they assume, parties to contracts may act either severally or jointly, or jointly and severally. When any joint liability exists, as in the last two instances, and one of the parties discharges it by paying more than his share of the indebtedness, he may, under the notion of an implied contract,

recover from the others their just proportion. This is termed "contribution." It rests on a doctrine of natural justice, and is more completely enforced in a court of equity. The right to enforce agreements against others may also be either several or joint; that is, it may inhere in a single individual or in two or more collectively. No right of this kind, however, can be both joint and several at the same time, and in this respect it differs from the corresponding liability. Parties may also act on their own behalf, or in a representative capacity as agents or partners. For the purpose of making a contract, a corporation, however numerous its members may be, is regarded as a single person. The second element of contracts, assent, is necessarily implied in the term "agreement"—a meeting of minds. Assent must be mutual, and have reference to exactly the same stipulations. There must not only be a proposal, but an acceptance, and if any modification in the terms of the original offer is made by the party by whom it is received no contract is established. The entire concurrence of all the parties concerned is indispensable. Such proposed change would be in itself a new offer which would need acceptance. It is not necessary that a proposal when made should be acceded to at once. An offerer may contemplate a continuance of the offer for a certain definite or understood period, within which assent may be expressed by the offeree and a valid contract created; or an offer to enter into an agreement may be sent to a person at a distance, who must reply by mail. In cases of this kind the contract, according to the prevailing opinion, is deemed to be completely formed from the time when the letter of acceptance is posted, without regard to the fact of its being received.

The element of consideration is that which gives contracts a legal, as distinguished from a moral, validity, for, as a rule, promises are not enforceable in law which do not rest on such a basis. The consideration is the cause of a contract, the return for a stipulation, the price for a promise. It may be something actually rendered, as is requisite in nearly all simple contracts, or its existence may be conclusively presumed, as in negotiable paper which has passed into circulation, and in contracts under seal. The formal execution of the latter dispenses with the requirement of an actual consideration. In the case of negotiable paper, a proper consideration will only be conclusively presumed when it is necessary to protect the interests of innocent purchasers for value into whose hands the paper has passed before maturity. The requisites of a valid consideration are that it shall either be some benefit to the party promising or some disadvantage or injury to the party to whom the promise is made. Considerations are distinguished as good or valuable. The former term is applied to inducements of relationship and natural affection, and is sufficient only in courts of equity; the latter, to some mode of making return which is either directly pecuniary or estimable pecuniary through its probable consequences in occasioning profit or loss. Marriage also is included within this latter designation. A good consideration will only support an executed contract, and then simply between the parties themselves. As illustrations of a valuable consideration may be mentioned the payment of money, the performance of work, the forbearance to sue, the delivery of property, the making of a promise for a promise, and the like. In such cases it is not necessary that the consideration be an equivalent for the agreement made, the adequacy of the consideration is in general unimportant. A moral obligation will constitute no legal consideration for a promise, except in cases where there has been a pre-existing legal obligation which is no longer enforceable in a court of justice, as where a debt has existed, but is barred by lapse of time under the provisions of statutes of limitation; or where some positive rule of law has prevented a legal obligation from arising, the effect of which rule has now ceased. If a consideration be illegal or impossible, the contract founded upon it will, in consequence, be rendered nugatory. Considerations are also distinguished, as regards the time of their fulfillment, as executed, executory, and concurrent. They are said to be executed when performed before the promise founded upon them is made, and are insufficient to support such promise unless they grew out of a previous request, express or implied, since the agreement can not be the reason of their accomplishment; executory, when they are to be performed in the future; concurrent, when they and the promises based upon them are simultaneous. The last two forms of consideration are sufficient to support all agreements otherwise unobjectionable.

The general principle in regard to the subject-matter of contracts is that parties may enter into agreements of any character they may choose. Certain important exceptions are, however, established on grounds of public policy. Thus the subject-matter must not contemplate any illegal undertaking. Such agreements are necessarily nugatory, and if attempted to be enforced their illegality may be alleged as a valid defense. But when the terms of the parties' stipulations are not thus contravened, it is the object of the courts to arrive at the exact meaning of the language employed as expressing the intentions of the persons contracting, and to enforce all unfulfilled obligations thence resulting. For this purpose certain definite rules of interpretation and construction have been established, which are adapted to remove ambiguities and resolve uncertainties. These are principally applicable to agreements in writing. If the application of these shows a comprehensible agreement, and no defenses alleged prove its invalidity or that its terms have been satisfied either wholly or in part, an adequate remedy will be given for its violation. In courts of law this consists of pecuniary recompense or damages for the injury sustained, while courts of equity, in proper instances, will decree a specific performance of the engagements undertaken.

Certain contracts are required to be in writing, for the better prevention of fraud and convenience in proving their stipulations. This requirement depends upon the so-called "statute of frauds." The principal classes of agreements within its provisions are contracts made upon consideration of marriage, contracts to answer for the debt, default, or wrongful act of another, contracts which are not to be performed within one year, contracts for the sale of any interest in land, and contracts for the sale of personal property of a specified value—usually fifty dollars and upward. In all these cases the agreement, or some memorandum thereof, when written, must also be signed, or in some States subscribed, by the party charged therewith or his agent. In the sale of goods, the delivery by the seller and the acceptance by the purchaser of a portion of the goods will render a reduction of the contract to writing unnecessary.

The remedy upon contracts by action at law is confined by "statutes of limitations" within certain prescribed periods after their maturity. The provisions generally made are that no action can be brought upon a simple contract after the lapse of six years, or upon sealed instruments after twenty years, from the time when they become due. (See LIMITATIONS, STATUTES OF.) Important and difficult questions also arise as to the effect of the laws of different States upon contracts when obligations are assumed in one country and sought to be enforced in any other (for which, see INTERNATIONAL LAW, PRIVATE, and MARRIAGE).

The Constitution of the U. S. provides that "no State shall pass any law impairing the obligation of contracts." Much discussion has arisen upon the effect of this prohibition. It has been decided that it applies as well to executed contracts or grants as to those which are executory. Not only agreements between individuals, but with States, as the charters of corporations, confer privileges which are inviolable, unless there is some prior reservation of a power to make alterations. An exception is, however, established in the case of municipal corporations, which are considered mere instruments of government, and continually subject to legislative authority. Moreover, contracts by which States undertake to resign necessary governmental functions are not generally deemed unchangeable by subsequent legislation, though an exception to this rule has been established in the case of taxation. A deprivation by a State of all remedy to enforce contracts is held to be an impairment of their obligation, and therefore unlawful; this is not true, however, when, on a change of remedies, one that is substantial and sufficiently convenient remains or is supplied.

Reference must be made for different forms of contracts to such topics as AGENCY, BILLS OF EXCHANGE, PARTNERSHIP, SALE, GUARANTY, BAILMENT, SHIPPING, INSURANCE, etc., and for defenses to PAYMENT, ACCORD, AWARD, RELEASE, SET-OFF, RECOUPMENT, USURY, etc. Convenient books of reference are the works of Anson, Pollock, Leake, Hare, Bishop, Parsons, Addison, Chitty, Hilliard, Metcalf, Smith, Story, Pothier, *On Obligations*, Kent's *Commentaries*, and Domat, *On Civil Law*.

T. W. DWIGHT.

Contract, Breach of: in law, the failure to comply with, or a default in the performance of, the conditions of a contract. The breach of a contract by one party where the breach is in a matter which is of the essence of the contract

gives the other party a right to reseind the contraet, bring an aetion for damages, or sue for speeific performance, as the case may be. The only relief obtainable in a court of law is damages as a eompensation for non-performanee; specific performanee ean be enforeed only in special eases, and by resort to a court of equity jurisdiction. See Rescission and Specific Performance. F. Sturges Allen.

Contractility [from Lat. *contra'here*, draw together]: a property by which the partieles of some bodies resume their original position when the force applied to separate them is withdrawn; also the vital property which gives to eertain parts (museles, for example) the power of contraeting, by means of whieh animals perform their motions. Contraetility, in the latter sense, is a property confined to living organisms. It is not peculiar to animals, but is shared by the vegetable kingdom; being, among plants, most apparent, as a rule, in the protophytes, which are microscopic plants of a low grade. Among the lowest forms of animals the whole substance of the organism usually possesses contractility, but in the higher animals this property is, by differentiation, limited more or less completely to the organs called muscles. But such motions as those of cilia are common to both the vegetable and the animal kingdoms; and among animals are common to man as well as to the protozoon. The existence of this important class of motions shows that in no organism is contractility entirely limited to the muscles. Contractility in such cases is quite independent of any will or self-determining power. But at a very low point—if not at the very lowest—in the animal seale we begin to find signs of a self-determining power, or will, residing within the organism, and having a certain degree of control over that contraetile quality of the tissues. Upon the exercise of this control depends the power of voluntary motion. Contraction of a musele may indeed be quite independent of volition or consciousness, as in the beating of the heart and in all motions of non-striated muscles. But all organic motion or contractile action appears to depend upon some stimulus, whether it be the mysterious nervous force or the not less mysterious influences called heat and electrieity. The immediate cause of muscular contraetion is quite unknown. The theory that it depends solely upon the oxidation of museular tissues is quite exploded. It is now held by many theorists that oxidation of non-organized blood-plasma within the capillaries of the muscles is one of the causes of muscular contraction, and that this oxidation liberates heat, which by the nervous influence is transmuted into kinetic energy. Electricity also appears to have intimate relations with some forms at least of organic contraetion.

Contraction: in surgery, the diminution or obliteration of the ealiber of any hollow vessel, more frequently called Stricture (*q. v.*). But frequently contraction denotes the permanent shrinkage in bulk (of an organ), in area (of a surface), or in length (of a muscle, tendon, or other elongated part). Contraction may result (1) from acute inflammation, with the formation of neoplasms; the latter afterward degenerating, or rather drying up, into ordinary connective tissue, which occupies less than the space of the original intrusive tissue. This is well illustrated in the case of burns which destroy much skin: the scar contracts and often causes shocking deformity. Yet it is the result of a process whieh is essentially reparative, and which is necessary to the recovery of a healthy condition. (2) From nervous irritation, direct or reflex. Thus the pain of a severe accident to the ankle has been known to be immediately followed by permanent strabismus. (3) From paralysis. Thus when only one of a pair of antagonistic museles loses its functional contraetility, the other by its normal exercise may produce a permanent deformity.

Contralto [Ital. *contra*, opposite + *alto*, high, the high (male) voiee < Lat. *al'tus*]: in vocal music, the part immediately below the treble, formerly called also the *countertenor*. It is often popularly called Alto (*q. v.*).

Contravallation [from Lat. *contra*, against + *valla'tio*, intrenehment, deriv. of *vallum*, rampart]: in fortification, an intrenchment formed by the besiegers between their camp and the plaee besieged, to secure themselves and cheek the sallies of the garrison. The line of *contravallation* is thus, as the name implies, a sort of counter-fortification.

Contrayer'va [Span. *contrayerva*, antidote; *contra*, against + *yerva*: Fr. *herbe*: Ital. *erba* < Lat. *herba*, herb]: the root of *Dorstenia contrayerva* of the natural order *Urticaceæ*. The plant is indigenous to the West Indies, Central America, and portions of Peru, and is also found in some parts of Brazil and other countries of South America. The root, which is the part employed in medicine, has one or two short heads, is fusiform, and about 2 or 3 inches long, dividing at the end into fine fibers. Its color is reddish brown, but internally it is white. It is somewhat acrid and bitter, and it has a disagreeable odor. It contains a volatile oil, resin, starch, and a bitter principle which is not crystallizable. Internally it aets as a stimulant tonic bitter, and is much used in eertain portions of South America in the treatment of fevers of the typhoid type. Its name contrayerva, meaning "antidote plant" or "antidote herb," is derived from the faet that it has been used, futilely of course, as an antidote to the bites of serpents. The dose of the powdered root is said to be from 10 to 20 grains. H. A. H.

Contreras, kon-trā'rāas: a battle-field 14 miles S. of the city of Mexico. The battle was fought Aug. 19–20, 1847, between the U. S. forces of Gen. Scott and the Mexican division of Gen. Valencia. See Churubusco.

Contreras, Hernando, de: son of Rodrigo de Contreras; b. in Spain about 1520. After the downfall of his father, 1549, he and his younger brother, Pedro, remained in Niearagua. Maddened by what they regarded as an unjust loss of their rights, they formed a wild seheme for seizing Peru, which they claimed to have inherited from their grandfather, Pedrarias. They were joined by some 300 adventurers, many of them fugitives from Hernando Pizarro's army. The plan was to seize the Isthmus of Panama, destroy the towns and plantations there so that a Spanish army attempting to cross should find no supplies, then to sail to Peru, where Hernando de Contreras was to be proclaimed king. As a preliminary they murdered the Bishop of Nicaragua, Valdiviero, who would have opposed them. They then seized ships and sailed to Panama, arriving just after the licentiate Gasca had passed on his way from Peru to Spain with an immense treasure. The conspirators easily took Panama (Apr. 20, 1550), where they seized part of the treasure that was still there. Hernando then followed Gasca nearly to Nombre de Dios, and another party went to Chagres to seek for more treasure. Panama being thus left weakly guarded, the citizens rose, reeovered it, and defeated the foree which hurried baek from Chagres. Hernando, hearing of the disaster, disbanded the rest of the men and fled. After wandering for a time with a few companions, he was drowned in trying to cross a river (May, 1550). Pedro had fled from Panama in a ship. Being pursued, he took to the shore and was never heard of again.

Herbert H. Smith.

Contreras, Juan Senen, de: a gallant Spanish general; b. in 1760 at Madrid; entered the Spanish serviee in early youth, and in 1787 visited Franee, England, and Germany on public affairs. In 1788 he fought against the Turks. In 1795 he began to serve against the French. He fought at Talavera in 1809; as a captain-general he defended Tarragona obstinately, but without success. He was taken prisoner and sent to France in 1811, eseaped in 1812, returned to Spain in 1814, and died in his native city in 1826. He wrote several books, chiefly military.

Contreras, Pedro Moya de: See Moya y Contreras.

Contreras, Rodrigo, de: a Spanish administrator; b. at Segovia about 1495. He was of a noble family, and married Maria de Peñalosa, the daughter of Pedrarias who had been betrothed to Balboa. In 1531 he was appointed governor of Nicaragua, and though he was opposed by Las Casas, Bishop Osorio, and other ecclesiastics, his rule was in the main prosperous. From Leon he sent an expedition under Diego Machuea, whieh explored Lake Nicaragua and its outlet, the San Juan (then called the Desaguadero), arriving at Nombre de Dios. There Machuca was seized by the governor, Robles, who sent two parties to take possession of the Desaguadero; but these were driven out by Contreras. The promulgation of the "New Laws" relating to Indian *encomiendas* (1542) threatened to deprive Contreras of a large number of slaves which he held. He went to Spain, where he was confirmed both in the *encomiendas* and in his offices; returned in 1544, but got into disputes with the Audience of the Confines. Charges were made against him, and in 1549 the *encomiendas* were confiseated. He again went to Spain, but could secure no redress. From 1554 to 1557 he was in Peru, where, probably, he died.

Herbert H. Smith.

Contribution [from Lat. *contribu'tio*, a lending of aid jointly; *con*, together + *tribu'ere*, furnish, pay]: in common law, an obligation imposed upon several persons who are under a common duty, or who own estates subject to a common burden, to share between them the charge of performing the duty of relieving their property of the burden. It is emphatically a rule of equity jurisprudence, and an illustration of the familiar maxim that "equality is equity." The illustrations of it are numerous. Such instances may be cited as general average in the law of shipping; the case of co-sureties, including insurers; that of owners of parcels of land subject to a single mortgage or other lien, where there are no special reasons for casting the burden of payment on one owner more than another; of joint debtors, etc. Contribution is sometimes exacted in a court of law on the theory of an implied contract, but the remedy is not so complete as in equity. It is usually said that there is no contribution among wrong-doers. This proposition must be received with some qualification, for while the rule must be rigidly applied to willful wrong-doers, and perhaps to such as are guilty of negligence, it could not be properly extended to persons who, acting in good faith, commit a technical wrong, as e. g. to sureties who execute a bond of indemnity to a sheriff to secure him against the consequences of a trespass in selling property which he has reasonable grounds for supposing belongs to a debtor against whose property he has an execution, while it turns out that the property does not belong to the debtor.

T. W. Dwight.

Contributions: in war, forced payments of money exacted from a conquered territory over and above the taxes used for its own government. They can be levied only by officers of the highest authority. The Germans in France in 1870 frequently made use of contributions, dooming particularly those towns or communes which had permitted attacks upon German soldiers, breaks in the transportation system, or other hostile acts, after occupation. They thus served as penalties. The Brussels conference of 1874 tried to restrict their employment, but without result. Though a harsh measure, they are lawful in modern warfare. See War and Requisitions.

Theodore S. Woolsey.

Contrition [from Lat. *contri'tio*, a wearing away, deriv. of *conte'rere*, rub in pieces; *con* + *te'rere*, rub]: in ordinary usage, denotes thorough repentance for sin. In the Roman Catholic Church contrition (*contritio cordis*) is the complete sorrow and utter detestation which the penitent feels for past sin, joined with the purpose to sin no more. Contrition, confession, and satisfaction are essential parts of the sacrament of penance. (*Canons of Trent*, s. xiv., c. 4.) But some, with Dens (*Theol.*, vi., 51), hold that *attrition*, or imperfect repentance, joined with confession, satisfaction, and absolution, is sufficient. Others teach that attrition is but a step leading toward contrition.

Controller [from deriv. of O. Fr. *contre-rolle*, duplicate roll or register (> Mod. Fr. *contrôle*) < Lat. *con'tra*, against + *ro'tulus*, roll. The spelling *comptroller* rests upon a false etymology]: an officer appointed to exercise certain duties in the superintendence of public finances, as the supervision of the accounts of other officers, etc. The Minister of Finance in France was formerly called *contrôleur-general*. The word is more commonly written Comptroller (*q. v.*).

Con'tumacy [from Lat. *contuma'cia*, deriv. of *con'tumax*, defiant, stubborn]: in law, especially in ecclesiastical law, a willful disobedience to any lawful summons or judicial order; contempt for the order of a court or legislature. See Contempt.

Convection: in physics, any circulatory movement in a fluid caused by inequalities of pressure, temperature, or electric potential. The direction of the convection current is always such as to tend to diminish the inequalities to which it is due. Well-known examples are trade winds, cyclonic storms, and the Gulf Stream. The circulatory flow in a vessel of water which is being heated and the air-currents to and from an electrified metallic point are also cases of convection.

E. L. Nichols.

Convent [from Lat. *conven'tus*, assembly, society, union; *con*, together + *veni're*, come]: literally, a meeting; a religious house inhabited by a society of monks or nuns, or, more strictly, the society itself. But in exact language the term convent designates a meeting (*conventus*) of all the members of a religious community, or, more properly, of those who can vote in the assembly. These voters are called conventuals, though the latter term is often used in other senses. On certain questions it is customary in some congregations to assemble the convent either for the counsel to be obtained from the brethren or for their consent to some ordinance. All the abbots of a congregation may be called upon in like manner to meet in a "provincial" or "general convent." See Monachism.

Conventicle [from Lat. *conventi'culum*, a lesser assembly; dimin. of *conven'tus*, meeting]: literally, an assembly or meeting of people. This term was early applied distinctively to the meetings of Dissenters from the established Church in England, first to the meetings of Wickliffe's followers, and afterward and more especially to those of the Scottish Covenanters. Severe laws for their suppression were passed, and hence the term came to be applied to almost any unlawful, secret religious assembly. An early act was passed in the reign of Elizabeth (1593) making the frequenting of conventicles punishable by imprisonment and death; but this was laxly enforced, and the best-known act for the suppression of conventicles was that passed by Parliament in 1664, making it unlawful for more than five persons over sixteen years of age, unless belonging to one family, to meet together for domestic or social worship. The first violation made the leader and the occupant of the premises liable to three months' imprisonment, or a fine of £5. A married woman who attended a conventicle was liable to imprisonment for one year, unless her husband paid a ransom of 40*s.* sterling. The punishment for the second offense was twice that for the first, and that for the third offense was transportation, or a fine of £100.

F. Sturges Allen.

Convention [from Lat. *conven'tio*, assembly, agreement; *con*, together + *veni're*, come]: in political language, an assembly of national representatives meeting on extraordinary occasions without being convoked by the legal authority. (See Convention-parliament.) In French history the name convention is applied to that assembly which met after the legislative assembly had pronounced the suppression of the royal functions (Sept., 1792), and proclaimed the republic at its first sitting. This body dissolved itself on the establishment of the Directory in Oct., 1796. The Scottish assembly which met on the flight of James II. of England was entitled the Convention of Estates. In the U. S. meetings of representatives specially chosen by the people of separate States to revise and amend the State constitutions are termed State conventions. The term convention is also applied to the meetings of delegates of the several political parties for the nomination of candidates for office.

Convention, in the language of diplomacy, is generally synonymous with treaty, with the vague distinction that a convention relates to a few or unimportant or non-political points. Contracts between belligerents as to certain rules to be adopted on both sides in carrying on the war are technically termed general conventions. Treaties between the pope and Protestant powers have been often termed conventions.

Convention, in military affairs, is a treaty between military commanders concerning terms for a temporary cessation of hostilities, generally between a victor and a defeated general for the evacuation of a district or position by the latter. The two most celebrated conventions of modern times were that of Closter-Seven (1757), between the Dukes of Cumberland and Richelieu, and that of Cintra (1808), between Junot and the English generals. See Constitution.

Convention-parliament: in Great Britain, a parliament convened without the authority of the sovereign, when the crown is in abeyance. As parliaments have no right to assemble without royal authority, the acts of convention-parliaments must afterward be ratified by a parliament summoned in accordance with the provisions of the constitution. Two convention-parliaments have occurred in English history—the first, that which met in Apr., 1660, and restored Charles II. to the throne, the Lords assembling by their own authority, and the Commons by virtue of writs issued in the name of the keepers of the liberties of England, by the authority of Parliament; the second, that which met in 1689, each house by its own authority, and when James II. fled from the kingdom, declared that his flight was equivalent to abdication, and offered the crown in joint sovereignty to William and Mary. See Convention.

Converse, Charles Crozat: See the Appendix.

Conversion [from Lat. *conver'sio*, a turning about, deriv. of *conver'tere*]: in metallurgy, the process by which steel

is produced from iron or from iron carbide (cast iron). Iron is converted into steel by long heating in contact with carbon. Cast iron is converted by "puddling," or by the well-known process of Bessemer. The theory in both cases is the same —viz., to oxidize the excess of carbon in the carbide.

Conversion: In law this word has two significations: 1. In equity jurisprudence it means the theoretical or presumed change of property from real into personal or personal into real. The will of an owner of property to change into personal property, expressed in legal forms, is in some instances equivalent, in legal intendment, to an actual change, as where a testator directs his land to be sold and converted into money. It is deemed to be sold from the moment of his death, and to have the qualities of personal property. This is termed *equitable conversion*. If it becomes impossible to carry out the purpose of the donor, testator, or the like, reconversion is said to take place, and the property is treated according to its real nature. 2. In the law courts the word "conversion" is applied to an unauthorized exercise of acts of ownership over the personal property of another. It is deemed to be a wrong or "tort," and the owner of the property may either reclaim it or treat the wrong-doer as having become owner and recover the value of it. Conversion lies at the foundation of the common-law action of trover, which word is derived from the French word *trouver*, to find. There is a legal fiction that the defendant found the plaintiff's property and converted it to his own use. The material part of the case is the conversion. To constitute a case of conversion it is not necessary that there should have been any intent to deprive the owner of his interest. It is enough if there were an intent to appropriate the goods or to exercise an act of ownership over them, even though that were done in entire ignorance of the owner's right. Thus if an auctioneer should sell stolen goods, not knowing of the theft, he would be deemed to have converted the goods to his own use. As the intent is a main ingredient in the case, it has been considered that a mere trespass, or an accidental loss of property by a carrier, or the use of property as an act of kindness to the owner without any intent to convert it, does not amount to a conversion. There is an important distinction between the case where the original taking of the goods is lawful and where it is not. In the former case there must in general be a demand and a refusal before the conversion takes place. Thus if a book is lent to another to be returned on request, there is plainly no conversion until the book is demanded and there is a refusal to return it, since until that time there is no exercise of ownership. When the original taking is unlawful, no demand is necessary. The better opinion is, when an action is brought for conversion, that the title to the chattel does not pass to the wrong-doer by mere force of the judgment of the court, but that there must be actual satisfaction of the judgment on his behalf. T. W. Dwight.

Conversion, in logic: See Logic.

Converter: in metallurgy, the receptacle used to hold the iron or carbide of iron which is subjected to the process of conversion into steel. See Steel.

Conveyance: in law, a deed transferring property from one person to another. In the transference of personal property the term, though strictly applicable, is not generally used.

Conveyancer: in law, one who makes a specialty of the drawing up of conveyances. In Great Britain conveyancers are persons whose sole business is the preparation of deeds, assurances, or other conveyances of property. They are obliged to take out a yearly certificate, upon which a considerable stamp duty is imposed. F. Sturges Allen.

Convict [from Lat. *convic'tus*, past ptc. of *convin'cere*, refute, triumph over; *con* + *vin'cere*, conquer]: a person adjudged guilty of a crime, whether by a verdict of a jury or by a judge alone. The method of treating convicts in any particular country or jurisdiction is termed its *convict system*. The question as to what is the best convict system is still unanswered. Experience has shown that none of the many that have been tried are free from very serious defects, both in their effects upon the community and upon the criminals. Some of the older convict systems, such as that of transportation and penal servitude, have been abandoned rather out of regard for their effect upon the non-criminal class, than out of any regard for the present or future welfare of the convicts. Others have been discontinued as a result of a feeling against the infliction of cruelty upon convicts, as well as out of regard for the community and the moral welfare of the convicts. F. S. A.

Convocation [from Lat. *convoca'tio*, a calling together; *con*, together + *voca're*, summon]: a meeting of the clergy of the Church of England to discuss ecclesiastical matters in time of Parliament. There is one convocation for the province of Canterbury and one for the province of York, but the voice of the latter is only a feeble echo of that of the former. Each convocation has two houses—the upper consisting of bishops, and the lower of deans, archdeacons, and proctors. Acts of convocation were formerly of great importance in the canon law, but since the time of Henry VIII. they have no force when opposed to statute law. The convocations have been recently revived, but with little or none of their ancient importance. There is an Irish convocation with even smaller powers than those of the English Church. In the U. S. the word is usually applied to voluntary associations of the clergy of the Protestant Episcopal Church. In Connecticut, during the episcopate of the first bishop, Seabury, the clergy met in convocation under the bishop's presidency each year, and even more frequently as need required. Revised by W. S. Perry.

Convol'vulus [from Lat. *con*, together + *volvere*, to roll, in allusion to the twining habit of most of the species]: a genus of dicotyledonous plants of the Morning-glory Family (*q. v.*), including about 150 species, widely distributed in temperate and sub-tropical countries. Many of these are twining climbers, while some are erect herbs or even undershrubs. The leaves are alternate, undivided or lobed, the flowers funnel-shaped and usually showy and mostly solitary, the ovary two-celled and four-ovuled, and the stigmas two and linear, filiform or thickened. Many of the species have been cultivated for their beautiful flowers—e. g. *C. arvensis*, *C. chinensis*, *C. mauritanicus*, and *C. ocellatus* from Africa, *C. pannifolius* from the Canary islands, *C. suffruticosus* from Madeira, and *C. tricolor* from Spain. The purgative drug scammony is a resinous exudation from the root of *C. scammonia* of Western Asia. C. E. B.

Convoy [from subst. to O. Fr. *convoier*, to conduct: Ital. *convia're* < Lat. **convia're*, make the way (*via*) together; cf. the subst. Ital. *convoglio*, Fr. *convoi*]: one or more ships of war employed to protect a fleet of merchant-vessels against an enemy by escorting them to their destination.

The right of convoy is a limitation in favor of the neutral upon the war right of visitation and search, and rests solely upon treaty agreement. In theory the convoying ship is supposed to have accurate knowledge of the lading, destination, and character of each vessel in the convoy, and to be answerable that it violates no belligerent right, that it carries no contraband, that it is not bound for a blockaded port. An inquiry of the convoying ship by a belligerent cruiser is therefore substituted for the actual examination of the vessel suspected. In practice it is very doubtful whether such complete knowledge of the character and cargoes of a fleet of merchantmen can be obtained by the convoying officer, particularly as there may be strong temptation for fraud in regard to these facts on the part of skipper or captain. In modern warfare it is believed that the right of convoy is not a valuable one, because (1) of the growth in freedom of neutral trade and the variety of destinations involved; (2) of the differences in speed, making fleet sailing impracticable.

Before the end of the eighteenth century the attempts to maintain a neutral right to convoy originated among the trading nations of Europe as against Great Britain, and were not successful. But the principle of convoy was one of the features of the second armed neutrality in 1800, by which Russia, Sweden, Denmark, and Prussia agreed to respect convoy as between themselves, and to oblige other powers, notably Great Britain, to concede their right to employ it, if necessary by force. This was so far successful that treaties were made between Great Britain and the three first-mentioned powers providing for a modified sort of convoy instead of search under definite conditions, though eventual joint search might be made. The U. S. maintains the principle of convoy in ten treaties, one with Peru being as recent as 1887. Of these ten treaties only one is with a European power, Italy, under date of 1871.

France has accepted the same principle in six treaties, all with American republics. And Spain, Germany, Italy, Austria, and the Baltic powers accept the right of convoy in their naval instructions. See International Law.

Theodore S. Woolsey.

Convulsions [from Lat. *convul'sio*, convulsion, cramp; *con* + *vel'lere*, *vul'sus*, pluck up, dislocate]: an acute nervous affection, occurring in paroxysms, during which the patient may lose consciousness; the muscles of the body are spasmodically contracted, and the limbs at first stiffened and twisted and then agitated by irregular involuntary movements. The face is distorted, the eyeballs rolled upward, the teeth clenched, frequently biting the tongue, which may protrude at the beginning of the attack. Respiration is arrested by contraction of the chest muscles and by closure of the glottis; in consequence, the color of the face darkens; at the same time the veins of the neck swell, and froth issues from mouth and nostrils. This condition persists for a shorter or longer time; thereupon the muscles again relax, respiration is restored, the agitation of the limbs having ceased; consciousness may be fully restored, or the patient falls into a heavy sleep lasting, perhaps, several hours. The appearance of the patient and the nature of the attack are the same practically in the convulsions of epilepsy, those of women in childbirth, and in many different varieties of convulsions so frequently seen in children. They may result from any cause which first irritates and then suddenly abolishes the functions of the brain and spinal cord; therefore occur in diseases of the nervous centers, in diseases of other organs of the body which transmit irritation to these centers; and finally in morbid conditions of the blood, influencing these centers, either by direct stimulation or by interfering with their nutrition. Under the first head may be mentioned congestion, or anæmia (bloodlessness) of the brain, inflammations, tumors, and premature ossification of the bones of the head, by which the brain becomes subject to abnormal pressure. In other and more obscure cases a congenital susceptibility to irritation, and consequent exhaustion of functions, seems to exist in the brain and cord, so that the most trifling circumstance may occasion a convulsion; to this we ascribe the convulsions of hysteria and of epilepsy. The latter is only distinguished by a constitutional tendency which persists during the intervals between the attacks, and suffices to cause their renewal. The hysterical convulsion, however, offers some peculiarities. During the attack, consciousness, although perverted, is not abolished; interference with respiration is less complete than in the typical varieties, leading to involuntary crying and laughing; there is no lividity of the face; no frothing at the mouth; and the return to consciousness is immediate, without a transition stage of heavy sleep. Neither the irregular convulsive movements, so-called clonic muscular contractions, of chorea or St. Vitus's dance, nor the rigidity or tonic contractions of tetanus, are sufficient to constitute a convulsion proper, in which the two forms of muscular contraction are combined, the last occurring at the beginning, the first at the end, of the attack.

Convulsions dependent on transmitted irritations are common, occurring principally in children; and may be spontaneous, owing to the congenital predisposition mentioned, by which normal physiological processes may become irritating; or they may be excited by inflammation of the gums in dentition (very rarely), by indigestion, by worms, by the invasion of acute diseases, as pneumonia, eruptive fevers, etc., or by some accidents, such as extensive burns, etc.

Women in childbirth are liable to convulsions of a similar character, and this dangerous complication, so-called puerperal eclampsia, is generally associated with an alteration of the blood, which is liable to occur during pregnancy, being due to transient kidney disease. These organs act imperfectly, and allow a retention of urinary elements in the blood which should be excreted by them; these retained elements act as a direct irritant to the brain centers, thus affording a most striking illustration of the morbid influence of altered blood upon the nerve-cells. Part of the albumen of the blood passes off in the urine at the same time. These convulsions are also called albuminuric or uræmic. They also occur in true nephritis or Bright's disease, and in that complicating the second and third stages of scarlet fever.

Various minerals and other poisons introduced into the blood have a similar effect on the brain and cord centers, causing convulsions. Finally, a great diminution in the entire volume of blood, caused by exhausting hæmorrhages or by diarrhœa depriving the blood of its water, has been shown to determine convulsions as certainly as if the blood had been poisoned.

Any convulsion may prove fatal, should the arrest of respiration be sufficiently prolonged, the danger varying greatly according to the cause, the uræmic convulsions of women in childbirth, or the so-called puerperal eclampsia, being by far the most frequently fatal. Hereupon may be successively classed, second, uræmic convulsions in primary nephritis, or that complicating scarlet fever; third, those caused by poisons; fourth, by the anæmia resulting from hæmorrhage or diarrhœa; fifth, by the irritation of morbid dentition, worms, or indigestion in young children; sixth, by diseases of the nervous centers or disorders in their circulation, as congestion, anæmia, etc.; seventh, the convulsions of epilepsy; eighth, those marking the invasion of acute diseases.

The treatment of convulsions may at times be addressed exclusively to the cause, as in the last three classes mentioned, where the danger of the paroxysm itself is known to be small. In the other cases, where life is liable to be endangered by the duration or rapid repetition of the convulsive attacks, relief is urgently demanded. The means are as follows: Compression of the carotids; alcoholic stimulants; venesection; sedative remedies, such as bromides, chloral, chloroform, etc.; anti-hysterical medicines; warm baths or cold applications to the head. Each of these is adapted to a special case. Compression of the carotids has been used principally in cases of idiopathic epilepsy; it is intended to relieve the congestion existing at the base of the brain. Cold applications to the head are used for the same purpose, and may be combined with other methods of treatment. Stimulants are only used where the convulsion results from hæmorrhage or inanition. Venesection is seldom resorted to, but may be required in cases of intense venous congestion of the brain, as indicated by an extreme lividity of the face and distension of the veins of the neck; its principal efficacy has been noted in puerperal convulsions. Large doses of chloral are especially useful in infantile convulsions, or for those of scarlet fever, or during the interval between the attacks to prevent their renewal. The sedative action of chloral is analogous to that of inhaled chloroform. The latter, however, is much more powerful, and may be used in more severe cases or where the patient is unable to swallow. Veratrum viride, when used with extreme care, is a powerful agent to lower the pulse, and may be used in the same cases as venesection, to dissipate the stagnation of blood in the veins. A warm bath, with or without mustard, may be of service in many cases, excepting in puerperal convulsions, where it is contra-indicated by the danger of moving the patient. The facility of its use with young children frequently makes it especially applicable to them. Hysterical convulsions are treated with nerve stimulants, such as assafœtida, valerian, ether internally, etc.; during the interval between the attacks galvanism should be applied to the spine. Apart from special indications, therefore, treat the average convulsion as follows: Loosen the clothing so that it may not interfere with respiration; see that the tongue is protected, to prevent injury by biting, and avoid in a general way any injury the unconscious patient may be liable to. A warm bath with cold applications to the head, or the latter alone, may be of service. When the paroxysm abates, large doses of chloral hydrate may aid greatly in preventing a repetition. When the paroxysms are very severe and frequently repeated, especially as seen in the puerperal cases, the administration of chloroform by inhalation is indicated. When there is intense venous congestion, and suffocation be imminent, venesection may be indicated and of service.

A. Jacobi,
F. E. Sondern.

Convulsionists: a party which arose among the Jansenists about 1730, and continued flourishing till the middle of the century. The position of the Jansenists was rather difficult at that moment. Supported by Cardinal Fleury and Archbishop de Noäilles, of Paris, the Jesuits had gained the ascendency. Then it was suddenly rumored that miracles were wrought on the grave of Dean François, of Paris, who died in 1727 and was buried in the cemetery of St.-Médard. He had been one of the most conspicuous Jansenists, and by his extraordinary charity and his ascetic life he had brought Jansenism in favor among the lower classes. People now crowded in great numbers to the cemetery, and when they reached the grave they were generally seized by convulsions, in which state of mind they then began to prophesy and to testify in favor of Jansenism. The Government ordered the cemetery closed and the fanatics imprisoned (1733), but earth from the grave proved to have the same effect as the grave itself. The enthusiasm, with

its convulsions and its alleged miraculous cures, continued for nearly twenty years. See P. F. Mathieu, *Histoire des miraculés et des convulsionnaires de St.-Médard* (Paris, 1864).

Conway, or **Aberconway**: a small seaport-town of Carnarvonshire, Wales; on the estuary of the river Conway, here crossed by a suspension bridge 327 feet long; 13 miles E. N. E. of Bangor (see map of England, ref. 8–E). Here is Conway Castle, a grand feudal structure with eight vast towers, on a steep rock, built by Edward I. in 1283. It is on the Chester and Holyhead Railway. Pop. (1891) 3,467.

Conway: town; capital of Faulkner co., Ark. (for location of county, see map of Arkansas, ref. 3–D); on St. L., Ir. Mt. and So. R. R.; 30 miles N. of Little Rock. Conway is the seat of a college for boys (Methodist) and a college for girls (Baptist), and has churches of five denominations, public schools, three lumber-mills, a cotton-oil mill, and has a large cotton-trade. Pop. (1880) 1,028; (1890) 1,207; (1900) 2,003. EDITOR OF "LOG CABIN."

Conway, HENRY SEYMOUR: an English general and field-marshal; second son of the first Lord Conway; b. in 1720. He had a high command in Germany in 1761, and was Secretary of State in the Whig cabinet in 1765–68. In 1782 he was appointed commander-in-chief of the army, and made in Parliament a motion to terminate hostilities against the U. S. D. July 10, 1795.

Conway, MONCURE DANIEL: writer; b. in Stafford co., Va., Mar. 17, 1832; graduated at Dickinson College, Carlisle, Pa., 1849, and after preaching as a Methodist for a short time attended the Harvard Theological School; after his graduation preached in Unitarian churches in Washington and Cincinnati. His first publication was a volume of sermons, *Tracts for To-day*. In Cincinnati he edited a magazine, *The Dial*, in which he endeavored to revive the spirit of *The Dial* of Emerson and Margaret Fuller. During the civil war his *Rejected Stone* was pronounced by Charles Sumner the most useful book of the time for hastening the emancipation of the slaves. In *The Golden Hour* he pushed the advantage he had won. He went to Virginia and brought off the slaves from his own home, and wrote an interesting account of the adventure. In 1863 he went to England to advocate the Union cause, and remained there many years preaching in the South Place chapel, London, in which William J. Fox, a famous Liberal, had preceded him. At the same time he was a diligent newspaper correspondent and a writer for the magazines. The following is a partial list of his books: *The Earthward Pilgrimage* (1870); *Sacred Anthology* (1874); *Idols and Ideals* (1877); *Demonology and Devil Lore* (1879); *Emerson at Home and Abroad* (1882); *George Washington and Mt. Vernon: Washington's Unpublished Agricultural Letters* (1889); *Life of Nathaniel Hawthorne* (1890); *Omitted Chapters of History Disclosed in the Life and Letters of Edmund Randolph* (1888); *Thomas Carlyle* (1881); *The Wandering Jew* (1881); *Pine and Palm*, a novel (1887); *Prisms of Air*, a novel (1891); *Life of Thomas Paine* (2 vols., 1892). Mr. Conway returned to his London pulpit in 1892, but settled finally in New York in 1900. JOHN W. CHADWICK.

Conway, ROBERT SEYMOUR: b. at Stoke Newington, London, England, Sept. 20, 1864; educated at City of London School; scholar of Cambridge and London; fellow of Gonville and Caius College, Cambridge; lecturer at Newnham College and in the University of Cambridge. He is author of *Verner's Law in Italy* (1887); *The Italic Dialects, with Text, Grammar, and Lexicon* (1882); the translator of vol. ii. of Brugmann's *Grundriss der Vergl. Gramm.*, and contributor to various journals.

Conway, THOMAS, Count de: general; b. in Ireland, Feb. 27, 1733. He was educated in France, where he entered the army and attained the rank of colonel. In 1777 he emigrated to the U. S. at the suggestion of Silas Deane; offered his services to Congress; was appointed brigadier-general, and in December of that year was made inspector-general with rank of major-general, in spite of Washington's protests. He became so prominent in the plot to deprive Washington of the command of the army that the associated conspirators were known as "Conway's cabal." In Mar., 1778, he offered, conditionally, his resignation, which Congress gladly accepted without conditions. Conway returned to France, and in 1784 was appointed governor of Pondicherry and the French settlements in Hindustan. In 1792 he returned to France to command the royalist forces in the south, but on the breaking out of the revolution was forced to flee the country. D. about 1800.

Co'ny: the name employed in the English Bible for the animal called in Hebrew *shaphen*, and now believed to be the Syrian hyrax, *Hyrax syriacus*. See HYRAX.

Conybeare, kŭn'i-bār, WILLIAM JOHN: Anglican clergyman; son of Rev. William Daniel Conybeare, the eminent geologist and divine; b. in England, Aug. 1, 1815; graduated at Cambridge 1837; was principal of the Liverpool Collegiate Institute 1842–48; d. at Weybridge, 1857. His fame rests upon his joint authorship with the late Dean Howson of the *Life and Epistles of St. Paul* (London, 1851), in which he contributed the translations of St. Paul's letters and speeches. SAMUEL M. JACKSON.

Conyers: town; capital of Rockdale co., Ga. (for location of county, see map of Georgia, ref. 3–G); on Georgia R. R., 30 miles E. by S. from Atlanta. The chief industries are cotton raising and milling. Pop. (1890) 1,349; (1900) 1,605.

Conyngham, MARQUESSES OF (1816): Earls Conyngham (1797), Earls of Mount Charles (1816), Viscounts Mount Charles (1797), Viscounts Conyngham (1789), Viscounts Slane (1816), Barons Conyngham (Ireland, 1789), and Barons Minster (United Kingdom, 1821).—FRANCIS NATHANIEL CONYNGHAM, second marquess, K. P., G. C. H., P. C., lieutenant-general, b. June 11, 1799, succeeded his father, Henry Conyngham, third baron, Dec. 28, 1832; d. July, 1876; succeeded by his eldest son, GEORGE HENRY, b. in 1825, who died in 1882, and was succeeded by his son, HENRY FRANCIS CONYNGHAM (d. Aug. 28, 1897).

Cooch Behar: See KUCH BEHAR.

Cook, ALBERT STANBURROUGH, Ph. D., L. H. D.: scholar; b. at Montville, N. J., Mar. 6, 1853; graduated from the Scientific School of Rutgers College 1872; tutor of Mathematics in Rutgers College 1872–73; studied English and allied branches at Göttingen and Leipzig 1877–78; associate in English at Johns Hopkins University 1879–81; studied in London with Henry Sweet, and at Jena with Profs. Sievers and Delbrück 1881–82; Professor of English in the University of California 1882–89; President of the California Teachers' Association 1887–88: Carew lecturer at Hartford Theological Seminary 1890–91; Professor of the English Language and Literature in Yale University 1889. Besides numerous contributions to *Modern Language Notes*, the *American Journal of Philology*, the *Transactions of the American Philological* and *Modern Language Associations*, the London *Academy*, and other periodicals, his chief publications are an edition of Sievers's *Old English Grammar* (1885–87); of *Judith, an Old English Epic Fragment* (1887–89); and of Sidney's *Defense of Poesy* (1890), which have been received with much favor, and accounted standard in Great Britain and Germany, as well as in the U. S.

Cook, CHARLES, D. D.: Wesleyan divine; chief founder of Methodism in France; b. in London, May 31, 1787; entered the Wesleyan ministry in 1817; went to France in 1818; traveled there, founding Methodist societies and aiding in the revival of the Huguenot churches till his death in Lausanne, Feb. 21, 1858. He wrote *L'Amour de Dieu pour tous les Hommes*. His *Life* was written by J. P. Cook (Paris, 1862).

Cook, CLARENCE CHATHAM: journalist and writer; b. at Dorchester, Mass., Sept. 8, 1828; graduated at Harvard in 1849, and studied architecture in the office of A. J. Downing (his brother-in-law) and Calvert Vaux, at Newburg, and afterward pursued for many years the profession of teaching. In 1863 Mr. Cook contributed to the New York *Tribune* a series of articles on American art, based upon the exhibition of pictures at the New York Sanitary Fair of that year. He continued the profession of teacher until 1869, at the same time contributing the art criticisms which appeared in the *Tribune*, besides occasional articles to magazines. In 1869 he went as correspondent of the *Tribune* to Paris, but resigned that position upon the outbreak of the Franco-German war, passed some time in Italy, and on his return to the U. S. resumed his connection with the *Tribune*. He published *The Central Park* (New York, 1868); *The House Beautiful* (New York, 1878); and edited, with copious notes, a new translation of Lübke's *History of Art* (2 vols., New York, 1878). Became editor of *The Studio* in 1884. D. in Fishkill Landing, N. Y., June 2, 1900.

Cook, DUTTON: b. in London in 1832; educated at King's College, and served articles for some time in a solicitor's

office. Afterward he was assistant editor of the *Cornhill Magazine*, dramaic critic to the *Pall Mall Gazette*, and contributor to other periodicals. Besides collections of essays and studies—*Art in England* (1869); *Hours with the Players* (1870); *Nights of the Play* (1883, 2 vols.), etc.—he has published *Paul Foster's Daughter* (1861); *A Prodigal Son* (1862); *The Trials of the Tredgolds* (1864); *Hobson's Choice* (1866), etc. D. Sept. 11, 1883.

Cook, Francis A.: See the Appendix.

Cook, Capt. James: navigator; b. of very poor parents at Marton, in Yorkshire, England, Oct. 27, 1728; entered the navy 1755, and served as master of a sloop at the capture of Quebec in 1759; commanded an expedition sent to the South Pacific Ocean in 1768 to observe the transit of Venus. After he had observed the transit with success on the island of Tahiti, he visited New Zealand and explored the coast of New South Wales. Having made important discoveries in geography, he returned by the Cape of Good Hope, and arrived in England in June, 1771. In 1772 he conducted another exploring expedition in the Resolution and Adventure, in order to discover the *Terra Australis*, a continent supposed to exist in high southern latitudes. He circumnavigated the globe, discovered the island of New Caledonia, and penetrated southward as far as 71° S. lat., but did not find the Terra Australis. He returned to England in July, 1775, having lost only one man by disease during the voyage. He published a well-written journal of his voyage (2 vols., 1777). In July, 1776, he sailed on a third voyage, the object of which was to discover a northwest passage by way of Bering Strait. He discovered the Sandwich islands in 1778, and explored Bering Strait. Having returned to Hawaii to pass the winter, the natives of that island stole one of his boats. Capt. Cook with a few men went on shore to recover it, and was killed by the savages Feb. 14, 1779. See A. Kippis, *Life of Captain James Cook* (1788).

Cook, Joseph: lecturer on religious and social topics; b. at Ticonderoga, N. Y., Jan. 26, 1838; graduated at Harvard in 1865, and at Andover in 1868; remained there as a resident licentiate till 1870. He was pastor of a church in Lynn, Mass., 1870–71, spent one year (1872–73) in Europe, carried on the Monday lecture in Boston 1874–80, in Europe and Asia 1880–82, and resumed the Monday lectureship in Boston in 1883. He published several volumes of the Monday lectures, which have been widely circulated, and in 1888 founded *Our Day*, a monthly periodical devoted to various reforms. D. in Ticonderoga, N. Y., June 25, 1901.

Cooke, Edward, D. D.: clergyman and educator; b. at Bethlehem, N. H., Jan. 19, 1812; graduated with honor at Middletown in 1838. He was teacher of Natural Science in the Amenia Seminary, in Dutchess co., N. Y., and afterward principal of the newly founded seminary at Pennington, N. J., 1840–47, and minister in various Methodist Episcopal churches at Boston and elsewhere until 1853. He took the direction of the institute now known as Lawrence University in Appleton, Wis., the presidency of which in its more prosperous days was again offered him, but declined. Returning to the East in 1861, he was two years pastor of the Harvard Street church in Cambridge, Mass., where he was one of the board of examiners of Harvard College, which conferred upon him the degree of D. D. in 1855. He was principal of the Western Academy at Wilbraham, Mass., 1864–74, and president of Claflin University, Orangeburg, S. C., 1874–84. D. at Newton Centre, Mass., Sept. 18, 1888.

Cooke, George Frederick: actor; b. in Westminster, Apr. 17, 1756. He made his first public appearance in 1776, performed in the largest cities of Great Britain and Ireland, was successful in both tragedy and comedy, and was a rival of John Kemble. In 1810 he visited New York, where he was equally popular, and where he died Sept. 26, 1812. He is buried in St. Paul's Churchyard in that city.

Cooke, George Willis: Unitarian preacher and author; b. in Comstock, Kalamazoo co., Mich., Apr. 23, 1848; educated at Olivet College, Michigan, Jefferson Liberal Institute, Wisconsin, and Meadville Theological School, where he was ordained in 1872; he has held pastoral charges in the Unitarian Church in Wisconsin, Michigan, Indiana, and Massachusetts; lectured before the Concord School of Philosophy, and the Peabody Institute at Baltimore; contributed to *The Critic*, *The Independent*; and published *Ralph Waldo Emerson: his Life, Writings, and Philosophy* (1881); *George Eliot, a Critical Study of her Life, Writings, and Philosophy* (1883); *Poets and Problems* (1886); *The Clapboardtrees Parish, Dedham, Mass., a History* (1887); *A Guide-book to the Poetic and Dramatic Works of Robert Browning* (1891).

Cooke, Jay: financier; b. in Sandusky, O., Aug. 10, 1821; went to Philadelphia in 1838, and became a clerk in the banking-house of E. W. Clark & Co., of which he became a partner at the age of twenty-one. He established the firm of Jay Cooke & Co. in 1861, and became well known as a successful Government agent for the war-loans during the civil war of 1861–65. The firm to which he belonged became agents for the Northern Pacific R. R., and their suspension in 1873 was one of the causes of the financial panic of that year. Mr. Cooke retained his connection with the railroad, and his subsequent operations in business were remarkably successful.

Cooke, John Esten: novelist and lawyer; b. at Winchester, Va., Nov. 3, 1830. He wrote, besides other works, *Leather Stocking and Silk* (1854); *The Virginia Comedians* (1854); a *Life of General Robert E. Lee* (1871); and *History of Virginia*. He served as an officer in the Confederate army in the civil war. D. Sept. 27, 1886.

Cooke, Josiah Parsons, LL. D.: chemist; b. in Boston, Mass., Oct. 12, 1827; educated at Boston Latin School and at Harvard, where he graduated in 1848; tutor in mathematics in Harvard 1849; instructor in chemistry; Erving Professor of Chemistry and Mineralogy from 1851; and director of the chemical laboratory. He received from Harvard the degrees of A. B., A. M., and LL. D., and from Cambridge, England, that of LL. D. He was corresponding secretary and president of the American Academy of Arts and Sciences. His principal publications are *Chemical Problems and Reactions*, to accompany Stockhardt's *Elements of Chemistry* (1853); *Elements of Chemical Physics* (Boston, 1860, several editions); *Principles of Chemical Philosophy* (Boston, several editions); *The New Chemistry* (1871, several editions and translations); *Religion and Chemistry* (New York, 1864); *Scientific Culture and other Essays* (New York, 1881; n. e. 1885); *The Credentials of Science the Warrant of Faith* (1888). D. at Newport, R. I., Sept. 3, 1894.

Cooke, Mordecai Cubitt, M. A., LL. D., A. L. S.: English botanist; b. in Horning, July 12, 1825; editor of *Grevillea* (1872–92); myeologist to the Royal Botanic Gardens, Kew. He has written many botanical works, mainly devoted to the fungi. Among them are *Illustrations of British Fungi*; *Mycographia*; *Handbook of British Fungi*; *Fungi, their Nature, Uses, etc.*; *Rust, Smut, Mildew, and Mould*; *Handbook of Australian Fungi*; *British Freshwater Algæ*; *British Desmids*, etc.

Cooke, Philip St. George: U. S. military officer; b. 1809 in Berkeley co., Va.; graduated at West Point in 1827, and Nov. 12, 1861, brigadier-general U. S. army. He served as infantry officer on the Western frontier 1827–33; in Black Hawk war 1832; engaged in the battle of Bad Axe; and adjutant Sixth Infantry 1832–33. As a dragoon officer he served on frontier duty 1833–46; on expedition to California during the war with Mexico 1846–47 (brevet lieutenant-colonel); as superintendent of cavalry recruiting 1848–52; on frontier duty and scouting 1852–56; engaged in skirmishes against hostile Indians tribes; quelling the Kansas disturbances 1856–57; on Utah expedition, in command of the cavalry 1857–58; preparing cavalry tactics 1859; and in command of Utah 1860–61. In the civil war he was in Virginia Peninsula 1862; engaged at Yorktown, Williamsburg, Gaines's Mill, and Glendale; in command of Baton Rouge district, La., 1863–64; superintendent of recruiting 1864–66; in command of the department of the Platte 1866–67, and afterward of the department of the Lakes; brevet major-general Mar. 13, 1865. He studied law and was admitted to practice, and is the author of *Scenes and Adventures in the Army* (1856) and *The Conquest of New Mexico and California* (1878). Retired from active service Oct. 29, 1873. D. in Detroit, Mich., Mar. 21, 1895.

Cooke, Rose (*Terry*): poet and story-writer; b. at West Hartford, Conn., Feb. 17, 1827; she married in 1873 and removed to Winsted, Conn., and thence to Pittsfield, Mass. A collective edition of her poems was published in 1888. The stories in *Somebody's Neighbors* (1881) and her other prose volumes are faithful studies of life and character in rural New England. D. in Pittsfield, Mass., July 18, 1892.

H. A. B.

Cookery: the art of preparing and dressing food by the agency of fire or heat. In its crudest form this was prac-

ticed by the earliest known human races. For centuries but little advancement was made. We read, it is true, of the magnificent feasts given in Greece and Rome before and early in the Christian era; but in those times any improvement made in the methods of preparing food was for the few, while the masses continued to live in the rudest manner. During the nineteenth century, however, great progress has been made. Scientists have given more attention to the study of nutrition, and in the last quarter of a century much has been done to educate all the people in the best methods of preparing food. Great Britain has taken the lead in this work, introducing cooking into her board and other schools. In the U. S., cooking-schools—private and connected with the public schools—have done much to spread the principles of healthful cookery. Following out the practical application of the theories of nutrition and of food values expounded in recent years by Vait and his followers of the Munich school of physiologists, there have been opened in the U. S. experiment stations for the study of human food and its best preparation scientifically and economically. A beginning only has been made in cookery from a scientific standpoint, but, under the name of the New England Kitchen, Mrs. Ellen H. Richards, of the Massachusetts Institute of Technology, with the assistance of Mrs. Mary H. Abel, has given this important work an impetus which is destined to tell in future work. With all these agencies in operation the twentieth century should show great advance in healthful and economical cookery, and consequently a physical and mental improvement in the people.

Effect of Heat on Food.—Cooking develops flavor and lessens cohesion, thus making our vegetable and animal foods more digestible. The effect of heat on animal foods is to coagulate the albumen, solidify the fibrin, and gelatinize the fibrous, tendinous, and connective tissues. A piece of raw beef will be spongy, tenacious, and tough. Cook it and it becomes firm, comparatively tender, easily torn apart, and of an appetizing flavor, while if it be cooked rare the juices will run freely. Albumen when subjected to a high temperature not only coagulates, but hardens. For example, the white of an egg, which is almost wholly albumen, will, if cooked for ten minutes in water below the boiling-point, coagulate in a soft, creamy mass. If the egg be cooked longer than ten minutes, say twenty or forty, the white will become a little firmer; but no matter how long the cooking may continue at the temperature below the boiling-point the white of the egg will be so soft that it will break into small particles when pressed between the fingers. If, on the other hand, the egg be cooked five or ten minutes in boiling water the white will be transformed into a smooth, hard, leathery substance, most difficult of digestion, because it does not break up readily. In cooking meats the albumen and fibrin are affected by high or low temperature in the same manner as the white of the egg, but the albumen in meats is so closely united with other elements that it is impossible to illustrate the effect of high or low temperature with the same clearness and ease as in the case of the white of the egg. The result of the application of different degrees of heat to albuminous substances is one of the most important principles in cookery. On the proper observance of this principle depends the healthful and economical preparation of a large part of daily food.

General Principles of Cooking Meat.—Some modes are more healthful or more economical than others; but since variety is necessary to both health and appetite, it is wise to secure it, even if in so doing the most desirable methods be not always followed. A piece of fresh meat, when exposed for a short time to a temperature of 212° or more, will become firm and hard on the surface. If the high temperature be continued for a long time not only the surface will become hard, but also the entire piece of meat, being stringy and indigestible as far as the intense heat has had time to penetrate. This is often seen in a steak, a roast of beef, a turkey or chicken, a piece of corned beef, etc. A piece of meat cooked at this high temperature will, when cut, break into tough, stringy pieces, juiceless and unpalatable. If the same piece of meat had been cooked a sufficient length of time in a temperature just below the boiling-point it would have cut into smooth, tender, juicy slices; for such a temperature would soften and gelatinize the tissues. At this temperature the juices of the meat are drawn to the surface and wasted unless precautions have been taken against loss. It is therefore necessary to form a hard crust on the piece through which the juices can not escape. This is done by exposing the outside of the meat to a high temperature until a thin crust is formed through the hardening of the albuminous matter on the surface. As soon as this result is attained the temperature should be reduced below the boiling-point. Meats cooked below or at the boiling-point do not have the appetizing flavor possessed by those cooked at a higher temperature, but the intense heat which is applied at first to harden the surface develops the flavor in roasted and broiled meats. If we wish to draw the juices and nutritive qualities from a piece of meat we cut it into small pieces, put it in cold water, and heat it slowly almost to the boiling-point. It must not boil if we wish to keep the albumen in a soluble form, as it should be kept for beef tea. All animal substances, if kept closely covered for any length of time at a temperature much below the boiling-point, will spoil quickly. This is particularly true of liquids. It is therefore important that the cooking should go on steadily for the appointed time, and then if the food is to be kept for any number of hours it should boil hard for a few minutes and then be taken from the fire and cooled rapidly. In making soups and broths it is advisable to have a slight vent in the cover.

With these few general remarks the special methods of cooking meats may now be considered.

Boiling.—For all except salt meats the water should be boiling rapidly when the meat is first put in. Cover the pot, and when the water begins to boil again, skim carefully. Let the water continue to boil rapidly for about fifteen minutes. In this time a thin, hard coating will be formed on the surface by the albuminous matter. This will keep the juices in the meat. At the end of fifteen or twenty minutes the pot should be drawn back where the water will just bubble at one side, not all over the surface. This temperature should be kept up until the meat is done. The time required for boiling a piece of meat depends upon the size and kind of piece used and the tastes of the family. All red meats should be cooked rare; all white meats, as well as all that have been salted, should be well done. A leg of mutton weighing 10 or 12 lb. will be moderately rare when cooked for two hours. A turkey weighing 10 lb. should be cooked for three hours and a half; if tough, it may take an hour longer. Fowl, when in good condition, will boil in two hours, but when old it sometimes takes four hours to cook them. A piece of corned beef will cook in five hours. It matters not how small or large the piece may be, the time will be about the same, because the fibers require that length of time to soften. Smoked tongues and hams should be well washed, soaked in cold water for twelve hours, then boiled for five hours.

Broiling.—This is probably the earliest known process of cooking meat. Simple and ancient as it is, in many households the broiling is done no better than, if as well as, in the days of semi-civilized man. The secret of good broiling is to have the surface of the article brown, not scorched, and all the rest tender and juicy. If the meat be red it should be rare, as beefsteak and mutton chops; but if white it must be well done. There are to-day so many appliances for this mode of cooking that it may be done over, under, or in front of a bed of coals, or under a sheet of flame in a gas-stove. In the ordinary household the coals may come from wood burned slowly to produce a bright bed, or a charcoal, anthracite, or bituminous coal fire may be employed. Where natural gas is used a bed of fire-brick is made hot and the gas then turned off, the broiling being done over the hot bricks. This is not satisfactory, as the bricks are not hot enough to give the first browning. A gas-broiler is often used. It is made somewhat like the broilers for artificial gas, and the broiling is done under a sheet of flame. This is much better than the heated bricks. The average housekeeper broils over a bed of coals. The coals should be clear and red and all the draughts be opened. Place the piece of meat in a double broiler and hold it close to the fire, turning frequently until the food is browned (about four minutes for a steak, chop, or small bird); then lift the broiler up a few inches and continue turning constantly until the meat is done. A steak or chop cut a little more than an inch thick will take ten minutes to cook; a small bird, like a quail, the same time. White meat will require a longer time, because it must be well done. This meat, however, will not need such constant turning as the rare meats; still, it must be turned frequently.

Roasting.—Perfection in roasting is gained by the use of a spit before an open fire. But so few modern ranges are provided with the proper arrangement for roasting before

the open fire that, as a rule, most folks in this country, and, indeed, in Europe, roast their meats in an oven. The same fixtures that are used in the gas-stove for broiling are used also for roasting. Roasting done in good gas-stoves is almost perfect; that done in the closed oven, while not ideal, may be at least satisfactory. The article to be cooked never should be placed in the bottom of the pan. Iron racks, with legs that raise them 2 or 3 inches, can be bought in any kitchen-furnishing store. Such a rack should be placed in the dripping-pan and the meat laid upon this. Dredge with salt, pepper, and flour, also dredge the bottom of the pan with flour. Place in an oven heated to about 450°. Watch carefully, that the flour in the bottom of the pan shall not burn. When it turns a dark brown, which may be in five or ten minutes, add enough boiling water to cover the bottom of the pan; but do not wet the meat. When the roast is brown on one side, turn it and brown the other. As soon as it is perfectly browned reduce the heat by closing all the draughts, and begin to baste the meat generously with the gravy in the pan and lightly with salt, pepper, and flour. Do this every fifteen minutes until the meat is cooked. The water in the pan must be removed after each basting. Now, the constant basting drives the heat from the surface to the center of the meat; it also tends to make juices. The basting, which was religiously attended to when roasting was done before the fire, furnished half the elements of success in this method of cooking. As it is more trouble to baste in the oven, many housekeepers sadly neglect this duty.

Stewing.—This is a process which admits of the use of the tough cuts of meat. Only enough water to cover the article is used. The cooking is continued for a long time at a low temperature, until the toughest piece of meat is made tender. The liquid which covers the meat never should do more than bubble slightly, and only at one side of the stew-pan. The meat may be cooked in one piece, or may be divided into small parts. The commonest method of preparing food in this manner is to have vegetables and other seasonings added to the meat, which is generally cut into small pieces. The gravy is thickened with flour. Success in making such dishes depends upon the slow cooking. If rapid boiling be permitted, the meat will become hard, tough, and stringy, and the flavor of the stew be ruined. It adds very much to the flavor of the stew if the meat be browned before adding water to it.

Braising.—This mode of cooking is a combination of stewing and baking. Formerly when all the cooking was done at an open fireplace, a braising-pan was made with a deep cover, on which coals were heaped, the pan being then placed over coals mixed with ashes, or hung over the fire. These pans were often used for baking a loaf of bread or anything that required the heat on all sides. The necessity for this kind of pan passed away with the introduction of ranges or stoves with ovens. Any deep pan, with a close-fitting cover, will answer for a braising-pan. In braising, only enough water to make a gravy is used. Herbs, vegetables and spice are frequently employed to add flavor to the piece of meat, but a seasoning of salt and pepper satisfies simple tastes. The meat is placed in the pan, and, if it have no fat itself, a little pork or some other kind of fat is placed on the bottom of the pan. The meat is dredged generously with salt, pepper, and flour; then the pan is covered and placed in a moderately hot oven. At the end of half an hour the cover is removed and about a pint of hot water added. The pan is then covered and returned to the oven, the heat reduced, and the meat cooked slowly for five hours, being basted every half-hour with the gravy in the pan, and salt, pepper, and flour; the water being renewed whenever necessary. At the end of five hours the gravy is thickened with flour. To have this dish in perfection, the cooking must be slow after the first half hour. At no time should the oven be hot enough to cause the water in the pan to bubble. Braising is one of the most economical methods of cooking, for there is no waste, and the toughest piece of meat can be made tender and savory in this manner. People with weak digestion can not always eat meats that are stewed or braised. It may be that all these dishes would be more healthful if the covers of the pans were so placed that there would be an outlet for any gases that may form in the long, slow process of cooking.

Frying.—This mode of cooking is the least healthful, and in the ordinary household is generally followed in an unscientific manner. To fry properly there must be enough fat to cover the article that is to be cooked. The fat must be so hot as to harden the surface of any article of food the moment it is immersed, making it impervious to the fat or the juices contained in the article itself. The albumen of an egg hardens so quickly that cooks take advantage of this quality to protect articles that lack albuminous matter enough on the surface to form a coating for the food. The egg does not brown quickly, nor does it take a fine color; so bread or cracker crumbs are used with the egg to give the surface color and crispness. Sometimes an article is lightly coated with dry flour or meal, as in the case of some kinds of fish. It is necessary to have perfectly sweet fat, free from foreign substances, such as water, crumbs, etc. This must be heated slowly to 350° or 400° F., depending, of course, upon the kind of article that is to be fried. When blue smoke rises from the center of the liquid, it indicates a temperature of about 350°. All articles that require three or more minutes' cooking, and such as are prepared with flour, eggs, sugar, butter, etc.—for example, fritters, doughnuts, muffins—should be dropped into fat at this temperature; but oysters, croquettes, whitebait, and anything else that requires but little cooking, should have the fat at 400° when immersed. The heat may be tested by a piece of stale bread; if this becomes a rich brown in one minute the fat is at about 350°, but if it browns in half a minute the heat is about 400°. Successful frying depends upon what the French term the *surprise*, meaning the almost instantaneous coagulation of the surface of the article. After this has taken place the temperature may be reduced a little, but never lower than 350°. If too many cold articles be immersed at once, the temperature will be lowered too much and the food absorb grease. The presence of water is always indicated by the fat's bubbling when heated. Pure fat has no motion, unless heated to a temperature that will fill the room with smoke and instantly burn anything that is dropped into it. An article of food properly fried should be so dry and free from grease when brought to the table that it would not soil a sheet of white paper. Frying in deep fat, compared with what is called frying in a shallow pan, is economy of time, materials, and work of the digestive organs.

Fish is subject to nearly the same treatment as meat, in boiling, broiling, baking, etc. The principle of applying intense heat at first, to coagulate the albuminous matter on the surface and develop flavor, is quite as essential in the one case as the other.

Soups and Broths.—In preparing these dishes the great end is to extract from the flesh and bones of the animal all the nutritious properties possible. For this reason the process is the reverse of that of boiling. The meat is cut into fine pieces and the bones are well cracked. All is put in cold water, that the soluble matter may be softened and extracted. The mass is then heated to a degree near the boiling-point, and cooked in this manner for six or eight hours. If it is never allowed to boil, the soluble albumen is left floating in the broth in a digestible form, as always should be the case in making beef tea for the sick. But if the soup be allowed to boil, this albuminous matter will harden into a dark, stringy substance, which is finally strained from the clear broth. Soups or broths cooked at this low temperature always will be liquid, no matter how rich they may be in meat extracts, because the temperature is not high enough to dissolve the gelatin in the bones and meat. To accomplish this, it is necessary to boil the soup gently for a great many hours. When the strained liquid becomes cold, it forms a jelly. The flavor, too, is different from that of a soup cooked below the boiling-point. If a still richer flavor be desired, the meat is first browned in its own juices, and then the cold water is added. Vegetables should not be cooked in a soup more than an hour and a half. Long cooking gives them a rank flavor, which they impart to the soup; and they also absorb the meat flavors.

Vegetables.—The effect of cooking upon vegetables is to soften the fibers and cause the starch granules to swell and burst, thus making the vegetable palatable and easy of digestion. All vegetables, except dried seeds, should first be put in boiling water long enough to soften the tissues and cook the starch—no longer. Over-cooking produces a dark, strong-flavored, indigestible dish. Vegetables of strong flavor, like cabbage, cauliflower, turnips, carrots, onions, etc., should be cooked in a generous amount of water, while the delicately flavored kinds, such as peas, asparagus, potatoes, etc., should be only covered with water. Nearly all vegetables are better for gentle boiling, but a cabbage should be cut into several parts and cooked rapidly in a large kettle of boiling water. The cover must not be put on the

kettle while the cabbage is in it. From thirty to forty-five minutes will suffice to cook a head. Cauliflower should be put, head down, into a kettle of boiling salted water and cooked for half an hour, boiling gently all the while. Green peas should boil gently with the cover of the saucepan drawn a little to one side. Although a potato will be hard and indigestible if underdone, it is only a step from this condition to over-cooking. If a potato be baked, boiled, or steamed too long, it will deteriorate from the moment the over-cooking begins. Potatoes, placed in a kettle on the fire and covered with boiling water, will cook in just thirty minutes. In a moderate oven a potato of medium size will bake in forty-five minutes. If potatoes must be kept warm for any length of time after cooking, they should be covered with a coarse towel through which the steam can escape. They never should be closely covered.

Bread.—All the grains, and even nuts and tuberous roots, are brought into requisition in making this staff of the human family's life. Owing to the large amount of gluten in wheat, that grain is particularly well adapted to bread-making. The perfect loaf of bread is the highest form of vegetable food. The amount of labor which a loaf represents is almost incredible. From the selection of the seed to put into the ground until the bread is taken from the oven the physical and chemical changes are many. Upon the quality of the wheat and the milling depends largely the quality of the bread. Flour made from wheat grown in a wet season, or that which has been wet and not properly dried, or which was grown in too highly fertilized soil, will not make perfect bread. The gluten of such wheat will have a tendency to soften when mixed in the dough. Freshly ground flour, even from the best wheat and the finest milling, will exhibit nearly all the characteristics of flour made from poor wheat, that is, it will soften in the dough; but the bread will have a particularly sweet, nutty flavor. The wheat should be perfectly dry before being ground, and the flour should have a month or more to season before being used. New flour and that made from grains grown in a wet season are improved by being dried in a warm place for a few hours before being used. Good flour will have a pleasant odor and a yellowish tinge, but if made from damp wheat it will exhale a musty, unpleasant odor. If a small quantity of flour be mixed with cold water and formed into dough and then be kneaded for a few minutes, it will show the quality of gluten in the flour. If the dough become smooth and elastic it will be evident that the gluten is sound, and that there will be no difficulty in making good bread. Flour and meals should be kept in a pure, dry atmosphere.

In the earliest ages the grain was pounded and rubbed between stones, or in a sort of mortar. Later two mill-stones were used, the power being either animal, or wind, or water. Since then the improvements in milling have been wonderful. The best mills have machinery that separates each part of the grain and finally reduces the most desirable to flour. By this new process a larger proportion of the inner coats of the grain is made into flour than by the old process with stones; therefore the bread is richer in gluten and phosphates. A whole-wheat flour also is made in which a still larger proportion of the nutritive qualities is retained than in fine white flour. The flavor of bread made from this flour is sweet and nutty; the loaf is brown. This is the kind of bread which should be given to children, because it has so large an amount of the elements necessary to make teeth and bones. Whole-wheat meal, commonly called graham, is the unbolted meal. Aside from the coarse bran, which is irritating to some digestive organs, it is very desirable in the form of bread.

In commerce flour is known as "new process" and "old process." By the old process the flour is ground between stones; in the new process the grinding is done on corrugated cylinders. Flour made by the new method is granular to the touch, and packs more closely than that made in the old way. Measure for measure, the new process flour will weigh one-eighth more than the old. The housekeeper should remember this when following the old cookery receipts which call for flour by measure. If weight be used the rule need not be changed.

Methods of Making Bread.—Man must have known bread first in an unleavened form, but in some way he learned that fermentation produced a more porous, and therefore a more digestible, kind of bread. The leaven was a mixture of flour and water, which was allowed to ferment; or a piece of the risen dough was kept from one baking to another. These two substances are still used a great deal, but this mode of making bread light is open to many objections. Unless the dough be watched carefully, lactic acid is formed, and often the stage of putrefaction is reached. Scientific men have sought for some other method of making bread light. Aërated bread was made by mixing, under pressure, water, flour, and carbonic acid. Various acids and alkalies were tried, and as a result of all the experiments we have many kinds of baking-powders. These answer for breads when baked in small cakes, but nothing has been found which can take the place of the yeast plant for the large, sweet, porous loaf. About 1850 Adolph Ignaz Mautner, of Vienna, produced the press-yeast, or what is known in the U. S. as compressed yeast. This ferment is perhaps the best of anything yet known for bread.

There are many methods of making bread, but they all aim at the same thing: a light, porous, digestible mass. Bread made in Great Britain and the U. S. has a larger proportion of crumb than crust, whereas the reverse is the case on the continent of Europe. The more crust bread has the sweeter and more wholesome will it be. The elements of success in bread-making are good yeast and flour, a thorough beating or kneading, the right temperature, the proper degree of fermentation, and careful baking. The dough is made in the following manner. Suitable proportions of water, flour, salt, and yeast are mixed together. The dough is allowed to stand in a warm place until it has changed into a light, spongy mass, a little more than twice the original bulk. This dough is kneaded again, and then shaped into loaves and rolls, after which time is allowed for a second rising. It is then baked. Simple as this process reads, it involves conditions and chemical changes which must be watched carefully, else the bread will not be perfect. The water which is added to the flour dissolves the sugar and albumen, softens the gluten, and hydrates the starch. If the temperature be right, active fermentation begins at once, although it is not perceptible for several hours. Some of the starch is converted into sugar; this and the sugar of the flour are converted into alcohol and carbonic acid. This gas is diffused through the mass. The minute bubbles, being retained by the tenacious gluten, cause the dough to expand. As long as the fermentation produces only alcohol and carbonic acid, it may go on until the dough has risen sufficiently; if, however, fermentation be allowed to go too far, acetic acid will be formed and the dough become sour. On the other hand, if fermentation has not gone far enough, heavy, indigestible bread will be the result. Fermentation is most rapid at about blood-heat, 98°. The water with which the flour is mixed should be at about 100° in cold weather, and at about 80° in very hot weather. If the flour be kept in a cold place in winter, it should be placed in a warmer room for several hours before being made into dough. If compressed yeast be used, it should be thoroughly dissolved in the water, that it may be evenly incorporated in the bread. The beating or kneading of the bread also must be thorough, that the particles of yeast shall reach every point in the mass of dough. Great care must be taken that the dough is not chilled while being kneaded or in the first period of rising. It is impossible to make good bread with dough that has been chilled in the early part of the fermentation. Dough that has risen to a perfect sponge, and then been kneaded and chilled, will, if made into rolls (which must rise in a warm atmosphere to more than double their size before the baking), give a finer, whiter, and tenderer texture than if the rolls be made with the freshly risen sponge. One hundred degrees is the proper temperature in which to start the fermentation. After a few hours the heat should be lowered to about 70°, and it should be continued at this temperature until the dough is a spongy mass. When it has reached this stage it should be thoroughly kneaded, to break up the gas bubbles and distribute them throughout the bread, thus insuring a loaf filled with small pores. After this kneading the bread must be shaped and raised again to about twice its original size. It is then placed in an oven heated to about 400° F., the temperature being lowered the last half of the baking to about 300°. Fermentation goes on in the interior of the loaf until the temperature is raised to about 212°. It will be seen, then, that the large loaves should not rise as much as the small ones before baking; indeed, it is a pity that there ever should be a large loaf, because the small ones give more crust, and the heat passes to the interior so quickly as to stop fermentation before acetic acid can be formed.

The porosity of the loaf depends upon the elasticity and

tenacity of the gluten in the flour. Gluten exposed to the action of acetic acid will liquefy and lose its tenacity; hence, bread that is sour also is heavy. If too large a proportion of water be used, the texture of the bread will not be so fine and tender, as the pores will be large and unevenly distributed. In baking bread undergoes certain changes. The heat expands the air, moisture, and carbonic acid confined in the dough, and causes the loaf to increase to about double its size; the alcohol is vaporized, and almost entirely driven off in the gaseous form; the starch granules become ruptured, and some of the starch becomes transformed into sugar and dextrin; the vegetable albumen is coagulated and unites with the gluten and starch to increase the strength of the cell-walls, preventing them from giving way under the expansion of gas and vapors. Many chemists advocate using enough yeast to raise the dough to the required lightness in a few hours; but practice has shown that such bread loses its moisture and fine flavor within twenty-four hours, whereas bread in which only a small quantity of yeast is used, requiring many hours to become light, keeps sweet and moist for several days. A small quantity of sugar hastens fermentation by giving the ferment something from which to produce carbonic acid at once. One ounce of sugar to 4 lb. of flour is a good proportion. MARIA PARLOA.

Cook's Inlet: a part of the Pacific Ocean; in Alaska, opposite the island of Kodiak; between lat. 58° and 61° N., and lon. 151° and 154° W. It is 130 miles long.

Cook's or **Hervey Islands**: a group of Pacific islands under British protection; between 18° and 22° S. lat., and 157° and 163° W. lon. Total area, 142 sq. miles. There are six main islands; Raratonga is the largest, and has a population of 3,000; Mangaia has 2,000; Vatui or Atui, 1,200; Aitutaki, 2,000. Total population, 8,900.

Cookson, CHRISTOPHER, M. A.: philologist; b. at Dallington, Northampton, England, Apr., 1861; educated at Clifton College and at Corpus Christi College, Oxford; at present (1893) assistant classical master, St. Paul's School, London. He is the author of *The Principles of Sound and Inflexion as Illustrated in the Greek and Latin Languages* (in cooperation with J. E. King, 1888), and *An Introduction to the Comparative Grammar of Greek and Latin* (1890); and is one of the contributors to *Thirteen Essays on Education* (1891). B. I. W.

Cooley, THOMAS MCINTYRE: jurist; b. at Attica, N. Y., Jan. 6, 1824; removed to Michigan in 1843, and became a lawyer in 1846. He became Professor of Law in Michigan University in 1859, a justice of the Supreme Court of Michigan in 1864, and chief justice in 1867, but retired from the bench in 1885. He was appointed an interstate commerce commissioner by President Cleveland Mar. 22, 1887, and became chairman of the commission, but owing to ill health resigned in Oct., 1891. He published many legal reports, digests, and compilations; *The Constitutional Limitations which rest upon the Legislative Power of the States of the American Union* (1868); *Commentaries on the Constitution of the United States, etc.* (1873); *Law of Taxation* (1876); *Law of Torts* (1879); *General Principle of Constitutional Law in the United States* (1880), etc., and *Michigan* in the American Commonwealth Series (1885). D. in Ann Arbor, Mich., Sept. 12, 1898.

Coolidge, SUSAN: See WOOLSEY, SARAH CHAUNCEY.

Coolidge, THOMAS JEFFERSON: U. S. minister; b. Aug. 26, 1831, in Boston, Mass.: educated in Switzerland, Germany, and at Harvard University, from which he received the degrees A. B. and A. M.: treasurer of Amoskeag Manufacturing Company; president of Atchison, Topeka and Santa Fé R. R. In 1892 he was appointed U. S. minister to France to succeed Whitelaw Reid, but was superseded by ex-Senator James B. Eustis, of Louisiana, in March of the following year.

Coolie, or **Cooly** [Hindustani, *kūlī*, laborer, porter]: in a general sense, an Asiatic laborer not belonging to the artisan class; in a more special sense, a native of China or India emigrating to some foreign country under contract of labor. This coolie emigration began when slavery ceased. As the free Negro could not be induced to engage in field-labor on the tropical plantations, and as the white man proved physically incapable of doing the work, the owner of a great plantation had, indeed, only one chance left—that of importing laborers from India or China. Both countries were overpeopled; both races were acclimatized. Toward the middle of the present century the traffic began. The first to avail themselves of the overstocked labor-market of China were the British colony of Guiana, Peru, and Cuba. In 1847 two vessels went from Amoy to Havana with, respectively, 350 and 629 coolies on board. A few years later on, however, dismal rumors sprang up, denouncing the whole traffic as a new form of slavery more degrading and atrocious than the old one. It was found out that of 4,000 coolies who had been consigned to the guano-pits of Peru not one had survived. Great Britain took effective measures against the evil in 1855, but the result was simply that the whole traffic fell into the hands of the Portuguese, and degenerated still further. The convention of 1866 between France, Great Britain, and China first succeeded in confining the evil within certain limits. At a much earlier date East Indian coolies had begun to emigrate to Ceylon, the Straits Settlements, and Tenasserim; afterward also to Annam, Burma, South Africa, and Mauritius. Between 1834 and 1837 about 700 coolies were shipped from Calcutta alone to Mauritius, and in 1838 it was ascertained that up to that year no less than 25,000 coolies had left India for Mauritius. From 1834 to 1872, 161,539 coolies were exported to Trinidad, Jamaica, etc.

Coomans, JOSEPH: genre and historical painter; b. in Brussels, 1816; studied at Ghent under Hasselaere, and at Antwerp Academy, and traveled in Algiers, Italy, Turkey, Greece, and the Crimea. His *Last Days of Pompeii* (1863) is celebrated. *Defeat of Attila* (1848) is in the city-hall, Brussels. Studio at Boulogne, near Paris.

Coomas'sie: capital of the kingdom of Ashantee, in Western Africa; about 120 miles N. N. W. of Cape Coast Castle; lat. 6° 35′ N., lon. 2° 12′ W. (see map of Africa, ref. 5–B). It was captured by the British in 1874, and again in 1895. Pop. 20,000. See ASHANTEE.

Coombe, WILLIAM: an English humorous and satirical writer; b. at Bristol in 1741. Among his works are a *Tour of Doctor Syntax in Search of the Picturesque* (1812) and *Tour of Doctor Syntax in Search of a Wife*, both in verse. D. Jan. 19, 1823.

Coon'tie, or **Coon'ta** [an Am.-Indian word]: the popular name of the *Zamia integrifolia*, a plant of the natural order *Cycadaceæ*, a native of Southern Florida. Its stem abounds in starch, from which a part of the Florida arrowroot is prepared. Other species of the genus are cultivated in the Bahamas and in Asia for their starch, which, however, is usually classed as SAGO (*q. v.*). Florida formerly produced great quantities of this commodity, of which the quality was often excellent.

Cooper, ANTHONY ASHLEY: See SHAFTESBURY.

Cooper, Sir ASTLEY PASTON, F. R. S., LL. D., D. C. L.: surgeon; b. in Brooke, Norfolk, England, Aug. 23, 1768. He began to study surgery under Mr. Cline in London in 1784. He became Professor of Anatomy at Surgeon's Hall in 1792, and surgeon to Guy's Hospital in 1800. In 1805 he was chosen a fellow of the Royal Society. He gained distinction by a valuable work on hernia (1804–07), and practiced surgery with great success in London. His annual income is said to have amounted to £21,000. He was appointed surgeon to the king in 1828. Among his works are *The Principles and Practice of Surgery* (1836–37); a treatise *On Dislocations and Fractures* (1822), and one on the *Anatomy and Diseases of the Breast* (1829–40). D. Feb. 12, 1841. See B. B. Cooper, *Life of Sir Astley P. Cooper* (1843).

Cooper, GEORGE HENRY: rear-admiral; b. in New York, July 27, 1822; entered the navy as midshipman Aug. 4, 1837; served in boat expeditions against the Seminole Indians in Florida; in the Mexican war he commanded a detachment at Point Isabel; was engaged in attacks on Tobasco, Alvarado, and Tuspan, and remained with the squadron until the capture of the city of Mexico; was employed in the South Atlantic blockading squadron during the civil war, and during the bombardment of Fort Sumter in 1863 was in command of the monitor Sangamon; was commandant of the navy-yard at Norfolk 1872, Pensacola 1875–76, and New York 1878–81; in command of North Atlantic station 1882–84. Retired 1884. D. in Brooklyn, N. Y., Nov. 17, 1891.

Cooper, JAMES: general; b. in Frederick co., Md., May 8, 1810; graduated at Washington College, Pa., in 1831; studied law with Thaddeus Stevens; was a Whig member of Congress from Pennsylvania 1839–43; and was a leading opponent of the repudiation movement in Pennsylvania in 1847.

He was attorney-general of Pennsylvania in 1848, U. S. Senator 1849–55, appointed brigadier-general of Union volunteers in 1861, served in Virginia, and died at Columbus, O., Mar. 28, 1863.

Cooper, James Fenimore: popular novelist; b. at Burlington, N. J., Sept. 15, 1789; was a son of Judge William Cooper. The latter removed to Otsego co., N. Y., about 1790, and founded Cooperstown. Young Cooper entered Yale College in 1803, and became a midshipman in the U. S. navy in 1808. In 1811 he quitted the naval service and married Susan de Lancey, a sister of Bishop de Lancey. He published anonymously, in 1820, *Precaution*, a novel, which was considered a failure. In 1821 he produced the *Spy, a Tale of the Neutral Ground*, which had great success, was republished in various parts of Europe, and translated into several languages. *The Spy* opened a new and fresh field of national and imaginative literature. His next work was the *Pioneers* (1823), in which he gave a graphic description of American scenery and the adventures of life on the frontier of civilization. He published in 1823 *The Pilot*, a tale of the sea, which was very popular. He represented with great success in this work the character of sailors and peculiar phases of maritime life and scenery. In the *Last of the Mohicans* (1826) he gave a vivid picture of the life and character of American savages and trappers. In 1826 he visited Europe, where he remained nearly six years, during which he published *The Prairie* (1827), *The Red Rover* (1828), an admired tale of the sea, and other works. He criticised and satirized the national defects and foibles of Americans in *The Monikins* (1835); *Homeward Bound* (1838); and *Home as Found* (1838). Among his other works are a *History of the Navy of the United States* (1839); *The Pathfinder* (1840); *Wing and Wing* (1842); *Afloat and Ashore* (1844); *The Chainbearer* (1845); and *Oak Openings* (1848). D. at Cooperstown, Sept. 14, 1851. See Lounsbury's *James Fenimore Cooper* (1883) in the American Men of Letters Series.

Cooper, Myles, LL. D., Oxon.: an accomplished scholar; second president of King's College (now called Columbia College), New York city; b. in England in 1735, and educated at Oxford; became a fellow in Queen's College. He removed to America in 1762, as assistant to Dr. Samuel Johnson, first president of King's College, and was made president in May, 1763. In the revolt of the colonies he remained loyal to the crown, and was compelled to flee the country. He became one of the ministers of the English chapel in Edinburgh. D. in Edinburgh, May 1, 1785.

Cooper, Peter, LL. D.: manufacturer, inventor, and philanthropist; b. in New York city Feb. 12, 1791. His early life was one of labor and struggle. He commenced in boyhood to help his father as a manufacturer of hats. He attended school only for half of each day for a single year, and beyond this very humble instruction his acquisitions were all his own. At the age of seventeen he learned the trade of coachmaking.

The foundation of Mr. Cooper's fortune was laid in the invention of an improvement in machines for shearing cloth. This was largely called into use during the war of 1812 with Great Britain, when all importations of cloth from that country were stopped. The machines lost their value, however, on the declaration of peace. Mr. Cooper then turned his shop into the manufacture of cabinet-ware. He afterward went into the grocery business in New York, and finally he engaged in the manufacture of glue and isinglass, which he carried on for more than fifty years. His attention was early called to the great resources of the U. S. for the manufacture of iron. In 1830 he erected works in Canton, near Baltimore. Subsequently he erected a rolling and a wire mill in the city of New York, in which he first successfully applied anthracite to the puddling of iron. In 1845 he removed the machinery to Trenton, N. J., where he erected the largest rolling-mill at that time in the U. S. for the manufacture of railway iron. In these works he was the first to roll wrought-iron beams for fireproof buildings. These works have now grown to be very extensive, including mines, blast furnaces, and water-power.

While in Baltimore Mr. Cooper built, in 1830, after his own designs, the first locomotive engine ever constructed on the American continent. It was successfully operated on the Baltimore and Ohio R. R. Next we find Mr. Cooper taking great interest and investing large capital in the extension of the electric telegraph. He was the first and only president of the New York, Newfoundland, and London Telegraph Company, which continued its operations for eighteen years. He was honorary director of the Atlantic Telegraph Company, president of the American Telegraph Company, and president of the North American Telegraph Association, which at one time represented more than two-thirds of all the lines in the U. S. He took part actively in the first expedition that laid the Atlantic cable in 1854.

Mr. Cooper interested himself early in the New York State canals. Before the water was let into the Erie Canal it was an anxious question what was the best propelling power for the boats to be employed on the canal. Mr. Cooper then made an interesting experiment of propelling a boat by means of an endless chain 2 miles long, supported on posts and rollers, which was driven by the force of elevated water, and might be driven by any other power. By means of this he propelled a boat 2 miles in eleven minutes, carrying with him the Governor, De Witt Clinton, and other distinguished men at that time. Although this method of propulsion was not adopted at that time, it has since been successfully applied in passing boats through the locks of the Delaware and Raritan Canal.

Mr. Cooper served in the New York common council; was a trustee in the Public School Society, first formed to promote public schools in New York, and when that was merged in the board of education he became a school commissioner; but the most cherished object of Mr. Cooper's life, early conceived and faithfully carried out as soon as his means permitted, was the establishment of an institution for the instruction of the industrial classes. Accordingly, in the year 1854, he laid the corner-stone of a large building at the junction of the Third and Fourth Avenues in New York, "to be devoted for ever to the union of art and science in their application to the useful purposes of life." This institution has grown under the fostering care of the trustees appointed by Mr. Cooper and his own unremitting attention till his death. It has a school of art for women, taught in the daytime, in which free instruction is given in all branches of drawing, in painting, wood-engraving, and photography. It has likewise a free school of telegraphy for young women. These schools for the daytime accommodate about 200. The provision made by Mr. Cooper for this woman's art school has since been increased by several bequests from others.

In the evening are opened the free schools of science and art for young men and women. Here mathematics, practical engineering, and practical chemistry are thoroughly taught, and free lectures are given in natural philosophy and the elements of chemistry. In the art department every branch of drawing and painting is taught. During the year 1891–92 instruction was given in the free night school of science to 1,266 male students, and to 1,758 in the art school. Besides these free schools, there is a large free reading-room and library at the disposal of all comers. About 1,500 resort to this daily, where they have free access to 520 periodicals and papers, foreign and domestic, and about 34,000 volumes. Besides this, there is a free course of lectures given every Saturday evening during the winter in the large hall of the Cooper Union, which will seat 2,000.

On May 18, 1876, the Independent party nominated Mr. Cooper for President of the U. S., and at the following election he received nearly 100,000 votes. D. Apr. 4, 1883.

J. C. Zachos.

Cooper, Thomas: Chartist poet; b. in Leicester, England, Mar. 28, 1805; self-educated while working as a shoemaker; became schoolmaster in 1827; led the Leicester Chartists in 1841; for lecturing during the "riots" of Aug., 1842, received two years' imprisonment. During this time he wrote an epic, *The Purgatory of Suicides*, and a series of stories, *Wise Saws and Modern Instances*. In 1847 appeared his *Triumphs of Perseverance* and *Triumphs of Enterprise*. In 1849 he edited a radical journal, the *Plain Speaker*, and in 1850 a skeptical periodical, *Cooper's Journal*; lectured on history, poetry, and literature 1851–52; wrote the novels *Alderman Ralph* (1853) and *The Family Feud* (1854). In 1855 he became converted and lectured much in support of Christianity. D. in Lincoln, England, July 15, 1892. See his *Autobiography* (1872).

Cooper, Thomas Apthorpe: actor; b. in London in 1776; played with much applause in London and the U. S. His daughter married a son of President Tyler, under whom Cooper held various Government offices. His acting was of the school of John Philip Kemble. D. at Bristol, Pa., Apr. 21, 1849.

Revised by B. B. Vallentine.

Cooperage [deriv. of Eng. *coop*, cage, box, tub, vat: O. H. Ger. *chuofa* (> Mod. Germ. *Kufe*): O. Sax. *cōpa*, from Vulg.

Lat. *cōpa* = Lat. *cūpa*, tub]: the art of making rounded vessels by binding together a number of wooden staves with hoops. It is of very ancient origin and was diffused among many nations. Pliny asserts that it was invented by a people who lived at the foot of the Alps. Wet cooperage consists in making casks and barrels for liquids, such as wine, molasses, etc. For flour, fruit, etc., the cooperage is called dry, and the vessels used are of inferior construction. White cooperage is the name given to the making of tubs, churns, etc. The staves, which are mostly cut by machinery, are made broader in the middle, and must be curved precisely, so that when they are placed together and bound by the hoops they must meet accurately at the edges. The best casks and barrels are made of oak of superior quality and thoroughly seasoned.

Co-operation: a method of conducting industry in which the capital is supplied by and the control rests with the operatives when the industry is productive, and the consumers when it is distributive.

Under ordinary circumstances business is controlled by capital. Sometimes a man uses his own capital in amounts sufficient to purchase the materials and supplies, and to hire the laborers or clerks. More often he relies on credit, either commercial or industrial, for a part of the necessary capital. In the largest industries, like factories or railways, the managers represent the associated capital of a number of stockholders. But in all these cases it is the ownership of the capital which gives the ultimate power of saying who shall direct the industrial action. This state of things has many advantages (see POLITICAL ECONOMY), but it has also certain disadvantages. It often produces conflicts between capitalists and laborers; it may sometimes give opportunities of extortion from consumers. To remedy these evils schemes of co-operation have been suggested, whereby industry should be managed either by the producers or by the consumers, instead of by the capitalists. Where the industry is managed by the producers, it is called productive co-operation. Where it is managed by the consumers, it is called distributive co-operation.

The term co-operation is most loosely applied in current use. It is often extended to cover cases of *profit-sharing*, where there is no change in method of management, but only a distribution of profits from time to time among the employees of a business, or, more rarely, among its customers. It is easy to see how this usage arose. A co-operative industry would usually, though not always, divide its profits in this way. This division of profits naturally came to be the prominent feature in the public mind, and any industry which divided profits was called co-operative. But this usage is thoroughly incorrect. Division of profits involves no more change in methods of management than is involved in the substitution of piece-work for day-work. It is merely a different method of payment of the laborers, whereby the employer hopes to obtain an increase in efficiency which will more than counterbalance any extra price which he may have to pay. By substituting the piece-work for day-work, he can increase his gross earnings. By giving the laborers an interest in the profits, he may perhaps increase his net earnings. Experiments in profit-sharing are of great importance, and are discussed in the article PROFIT-SHARING, but they do not involve the change of industrial system which is contemplated by the advocates of co-operation.

Productive Co-operation.—The guilds of the Middle Ages were to all intents and purposes co-operative enterprises. That is to say, they 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 as factories displaced manual labor, capitalists displaced independent workmen, even in those industries where processes were but little changed. It was not until about the middle of the present century that we find organized attempts to establish associations of workmen carrying on business for their own account. A society of co-operative masons was founded in Paris in 1848 which, in spite of the hostility of the Government, worked its way to well-deserved prosperity. In the same year a number of French piano-makers organized an industry of their own, with almost equally marked success. Similar associations have been developed among painters and other trades in France. In Great Britain and the U. S. they have been less successful. There is a record of a Boston tailors' associative union in 1849, but it was in the iron-foundry business, immediately after the civil war, 1861–65, that the first successes in the U. S. were achieved. In woodwork of various kinds the system has become still more widely extended, especially at St. Louis, while co-operative boot and shoe companies have been successfully organized in Massachusetts; though it should be said that the co-operation in this case is often nominal rather than real, the business being in fact managed by joint-stock companies.

By far the most successful experiment in productive co-operation in the U. S. is found among the coopers of Minneapolis. In 1868 a few journeymen coopers, under the leadership of C. W. Curtis, made an attempt to manage industry for themselves. Their work was successful, and was developed in more formal shape in 1874 by the organization of the Co-operative Barrel Company. Other shops of the same sort have since been organized, and with nearly the same success. An impartial investigator, Mr. Albert Shaw, says that the business methods of the co-operative shops are admirable, and their credit high; that the system has developed business capacity in men who were not aware that they possessed it; and that the moral effects of the co-operative movement constitute its highest success. It should be noted, however, that the conditions among the coopers are especially favorable for co-operative enterprise. The amount of capital involved is relatively small, and the workmen are therefore able to furnish it themselves instead of borrowing. The processes are simple, so that there is little or no risk of misdirection of labor and capital. Above all, a large part of the work is done for orders, instead of being thrown on a speculative market, so that the risks which, under ordinary circumstances, a capitalist must bear are conspicuously absent. This possibility of working for orders, instead of for the general market, is usually essential to the success of productive co-operation.

Consumers' co-operation, or *distributive co-operation*, has had a longer continuous history. Under the influence of thinkers like Saint-Simon and Fourier in France and Owen in England many attempts to do away with the capitalist were made by communistic societies. More than three hundred such societies were started in the United Kingdom between 1820 and 1830. But it was not until 1844 that a thoroughly successful co-operative store was established by the "Rochdale Pioneers." In that year there was great depression in the flannel trade at Rochdale, and a number of weavers clubbed together to purchase their supplies more cheaply. Rudely organized as it was, the advantages of the plan proved to be enormous. Twelve years from its first beginning this society possessed a capital of £13,000, and conducted a general supply business of almost every kind, amounting at times to decidedly over £200,000 a year. The co-operative organization spread to all parts of the United Kingdom, the most widely known co-operative stores being those of the army and navy and the civil service. Meantime there had been many such organizations in the U. S. Isolated experiments were made as early as 1830. In 1845 the Workmen's Protective Union of Boston organized a successful store, which was afterward carried on under the name of the New England Protective Union. The war interrupted this development, but after its conclusion it was taken up with renewed vigor. In the West, and afterward in the South, the Patrons of Husbandry encouraged the local granges to form purchasing clubs, employing general agents to buy supplies, often at a great apparent discount. The Sovereigns of Industry, organized in 1874, made co-operative distribution one of their principal objects, and were of great importance in New England, where the grange movement at that time was weakest. But the stores of the Sovereigns of Industry were unsuccessful, and the same thing may be said, with some reservations, of the Patrons of Husbandry also. The purchases were not always judiciously made, and after a brief time the stores found themselves filled with unsold goods. Economy was attempted in the wrong direction. The co-operators thought that the surest way to get their supplies cheap was to hire managers cheap. They found to their cost that cheap management wasted many times more money than it saved. It must not be inferred from this that all the co-operative enterprises were failures. On the contrary, there remain a large number of associations which have done useful work for a long term of years. But it is to be noted that many co-operative stores have been reorganized into joint-stock companies in such a manner as to be co-operative only in name.

There are other forms of distributive co-operation quite

as important as the stores. Chief among these are the societies for furnishing co-operative credit. The most important experiments of this kind in the U. S. have been the numerous BUILDING AND LOAN ASSOCIATIONS (*q. v.*), and they have accomplished a work which can hardly be overestimated. A similar system of co-operative credit enterprises has been undertaken on a wider scale in Germany, under the leadership of Herr Schulze-Delitzsch. These were first established in 1850, and for a long time formed an important element in developing the industry of the country. Mutual insurance forms another important field of co-operative enterprise. In the U. S. it has been most successful among manufacturing industries. About the close of the civil war a number of factories, which had to pay extremely high insurance rates on account of the general prevalence of fire in manufacturing establishments, undertook to insure one another instead of relying on an outside company for their insurance. Not content with adjusting the losses, they undertook to render those losses themselves as slight as possible, and to secure the adoption of rules and methods which should, as far as possible, prevent fires in the associated factories. In this they were extremely successful. Under the leadership of Mr. Edward Atkinson, they reduced the frequency of fires to a very small fraction of what had been previously the rule, and were enabled to do their business at appreciably less cost, on account of the reduction in insurance and the superior methods of construction. We may also note certain forms of distributive co-operation among farmers, of which the establishment in the U. S. of co-operative creameries has been perhaps the most successful. At first sight this seems like productive co-operation, but it is really analogous to the work of the store or the mutual insurance company, since the industry is managed by those for whom the service is rendered. For details with regard to the success or failure of many of these enterprises, see John Hopkins University *History of Co-operation in the United States.*

Socialists believe that co-operation ought to be made more general. Many of them rely on this means for changing the structure of industrial society. The plan of Ferdinand Lassalle contemplated the establishment of a system of government credit, whereby any association of workmen could mortgage the future results of their labor and borrow capital on this security. In this way Lassalle thought that the present monopoly of the capitalists in the control of industry would be done away with. A man who had no capital, but was willing to work, would be on the same level as one who had inherited capital from his father, or saved it from his business. But the history of co-operative enterprises gives little ground to expect much good from a project of this kind. On the contrary, it indicates that the waste of capital under the new system would many times outweigh whatever losses and difficulties there may have been under the old. Its advocates claim the following advantages from the co-operative system: 1. It does away with the conflicts between labor and capital. 2. It avoids the expenses of advertising and certain unnecessary expenses of management, which are incident to the conduct of business to-day. 3. It prevents the exorbitant profits which capitalists have been wont to charge. The weak point in the argument of the co-operators lies in the assumption of the existence of these exorbitant profits. It is a question whether, under the existing methods of industry, the losses from depreciation of capital do not practically wipe out most of the returns received in the form of interest. It is certain that these profits are very much less than is ordinarily supposed, and that the loss due to any slight falling off in efficiency and economy would be a much greater burden on the community than the profits which are now distributed among capitalists as a class. We come back, then, to the question can we expect to have as high a degree of efficiency and economy when business is managed by laborers or consumers as we have under the present system. To this inquiry, at present at any rate, our answer must be in the negative. While capitalistic management does not always put the best men in control, it keeps many classes of incompetent men wholly out of control. It is a system of natural selection, not wholly perfect, but thoroughly good in certain respects. If a man sees what the community wants and supplies it in an efficient manner, he makes money and is able to extend his operations. If he does not see what the community wants, or fails to supply it in an efficient manner, he loses so much money that he is unable to remain in control. Matters do not always work as well as this, but the general operation of the system is what has been here described. On the other hand, if the managers are chosen by the votes of the workmen or the consumers, experience, both of the guilds in the past and of the co-operative societies in the present, shows that we shall not generally have the most efficient men at the head. They will supply goods which the community does not want, or insist on making them by old methods when new ones would be better.

In the cases where co-operation has been most successful, like loan associations or mutual insurance companies, their success has been largely due to their educational character. Sometimes they have taught men to acquire business ability by showing them how the exercise of such ability was an essential means of success. The adoption of a plan like that of Lassalle, which should give every workman the right to control capital simply on account of his willingness to work, without regard to his business ability, would defeat the very end which the best co-operative societies have had in view. Sometimes they have taught men to develop new business methods of sounder character than the old. It may occasionally happen that abuses have introduced themselves into the conduct of a business, and under such circumstances co-operative enterprises may succeed in avoiding precisely those abuses. The case of the co-operative stores in Great Britain is an instance in point. Up to 1864 business there was managed largely under the credit system, and in many lines at least there was quite inadequate provision against bad debts. Such was the conservatism of the people that a store that required cash payment could not secure the necessary custom. But a number of persons, voluntarily associating themselves in a co-operative enterprise, could and did agree to pay cash; and by the substitution of cash for credit they saved money in a multitude of ways, and were able to obtain their supplies much cheaper, just as in the U. S. the mutual insurance companies were able to obtain their insurance much cheaper by voluntarily submitting to a number of rules that they made themselves, and which proved a safeguard against fire. As long as the old-fashioned stores in Great Britain continued to run on the credit system, so long the co-operative stores had a decided advantage. The cash system has now come to prevail in the retail trade of the United Kingdom to nearly the same extent that it does in the U. S. With this change of business habits the co-operative stores have lost their advantage, and the regular joint-stock establishments are now able to make as cheap prices as the co-operative ones and to hold their own with them in every respect. Again, it may readily happen that the workmen in some particular line of industry are not doing justice to their own ability—are habitually working in a slack manner, which involves waste of materials or loss of power, not to say loss of time also. Under such circumstances the stimulus which is given by working for themselves may result in an increase of zeal and efficiency which outweighs any disadvantage in business management. If it has further happened that the capitalist has been subject to the liability of strikes and that the co-operators are free from this danger, this advantage is greatly increased. But the cases where the advantages of productive co-operation have outweighed its advantages seem to have been relatively few—fewer, perhaps, in the U. S. and Great Britain than in France or Germany. Some think that this difference is due to the fact that the labor power of the British or U. S. workmen is under ordinary circumstances far better utilized than that of the Frenchman or German, and that this leaves less margin of possible advantage due to the increased stimulus of co-operation. If a man in the U. S. is working nearly as hard as he can, while the Frenchman or German is only working at half his possible speed, the chance for increased stimulus in the former case is obviously much less than in the latter.

Taking all these things into account we must for the present regard co-operation rather as an occasional means of success and as a useful educator than as a practicable method of conducting ordinary business. It may be that as the community becomes more generally educated in business methods and business habits the field of possible success for co-operation will constantly widen. This is a result that every one must desire to see realized. But such an educational result can only come through gradual progress and voluntary co-operation. The attempt to devise schemes of universal credit which should give the man who had not saved money the same chance to manage business with the one who had would defeat the end in view.

See George Jacob Holyoake's *History of Co-operation* for an account of European experience, and N. P. Gilman's *Profit-sharing between Employer and Employee.*

A. T. Hadley.

Co-operative Banks: See Building and Loan Associations.

Co-operative Insurance Societies: See Fraternal Insurance Societies and Life-insurance.

Co-operative Savings and Loan Associations: See Building and Loan Associations.

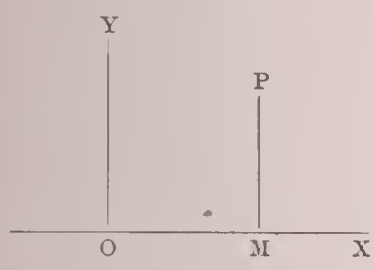
Cooper River: a river of South Carolina; rises in Charleston County, and flowing southeastwardly unites with Ashley river to form Charleston harbor.

Cooper's Creek: a stream in the interior of Australia; formed in Queensland by the junction of the Victoria and Thomson creeks; flows southward, and empties itself into the salt lake Gregory. Cooper's creek has a tragic interest, from the fact of the explorers Burk and Wills having perished in its vicinity.

Cooperstown: village; capital of Otsego co., N. Y. (for location of county, see map of New York, ref. 5–H); pleasantly situated on Cooperstown and Charlotte Valley R. R. and at the south end of Otsego Lake. The lake is 9 miles long, and is traversed by steamboats. Cooperstown has a union school and academy and an orphan asylum. Pop. (1880) 2,199; (1890) 2,657; (1900) 2,368.

Editor of "Freeman's Journal."

Co-ordinates: in mathematics, a system of lines or algebraic quantities by which the position of a point or line is determined. The most common system is called the Cartesian, after Descartes its inventor. Two lines of reference, O X and O Y, are taken, called axes of abscissas and of ordinates respectively. The position of P is then determined by the distances O M, called the abscissa, and M P, called the ordinate, which two distances are called the co-ordinates of the point P. The corresponding co-ordinates of a straight line are the negative reciprocals of the lengths, measured from O, which it cuts off from the respective axes of co-ordinates. In polar co-ordinates an initial axis is assumed (one extremity of which is called the pole), and an initial plane passing through the axis. Various other systems of co-ordinates are employed in analytical geometry.



Coorg: See Curg.

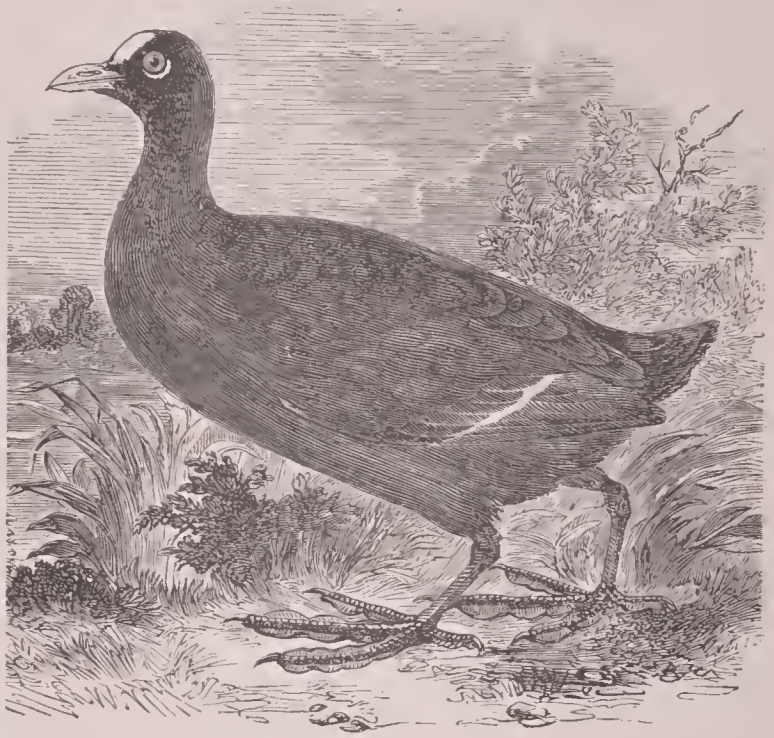
Coornhert: same as Cornhert (*q. v.*).

Co'os (in Gr. Κόως): the New Testament name (Acts xxi. 1) of the island of Cos (*q. v.*); a small island at the eastern entrance of the archipelago, celebrated in ancient times for its light woven fabrics, its excellent wines, and more especially for its famous temple of Æsculapius, which was virtually a museum of anatomy and pathology, from its votive models, and to which was attached a school of physicians. The chief town, of the same name as the island, stood on the northeastern shore, near the promontory of Scandarium, and derived considerable importance from its position as an intermediate station between Miletus and Rhodes. St. Paul passed a night there on his third missionary journey. The history of the island has many interesting points of connection with the Jews. From the edict of Simon Maccabæus (1 Macc. xv. 23) we learn that many Jews were settled in the island, and Josephus (*Antiquities*, 24, 7) tells us that during the Mithridatic war the Jews of Cos were very wealthy.

Coo'sa: a river of the U. S.; formed by the Etowah and Oostenaula, which unite at Rome in Georgia. It crosses the eastern boundary of Alabama, flows southwestward, and then southward, until it unites with the Tallapoosa on the southern border of Elmore co., Ala. The stream thus formed is the Alabama river. The length of the Coosa is estimated at 350 miles.

Coos Bay: the principal harbor of Southern Oregon. Its entrance, just N. E. of Cape Arago (lat. 43° 20′ 38″ N., lon. 124° 22′ 11″ W.), is very good, and its bar has 14 feet of water at high tide. The Coos river flows into it. Four miles from the bar, on the south shore, is Empire City, the capital of Coos County; and 4 miles from the mouth of the river is Marshfield, an important coal-mining center. The bay is important chiefly for its vast quantities of Tertiary lignitic coal, which is found on the south side over a large area. It is by many regarded as the best coal on the Pacific coast, but is inferior to the bituminous coals. The bay is surrounded by an elevated and densely timbered region.

Coot: a name applied in the U. S., and especially on the New England coast, to several ducks of the genus *Oidemia*. The white-winged coot is *Oidemia fusca*, skunk-head coot *Oidemia perspicillata*. In the South the name is given to



Common European coot.

the sora rail (*Ortygometra carolina*). In Great Britain the name is generally applied to the *Fulica atra*, a wading bird allied to the rails. The *Fulica americana*, found in nearly all parts of North America, is the bird to which the name coot should be restricted in the U. S. In its habits the coot very much resembles the water-hen. It lives in lakes or large ponds, or along the quiet banks of calm rivers, feeding upon mollusks, insects, and similar creatures, which it finds either in the water or upon land. It is an excellent swimmer, swift and strong, its toes being fringed with a wide flattened membrane on the edges, which present a broad surface to the water. It walks quickly and not without a certain grace, and when it perches it grasps the branches firmly, owing to the contraction of the foot.

Revised by F. A. Lucas.

Coote, Sir Eyre, K. B.: British general; b. in Ireland in 1726; went to India in 1754; became governor of Calcutta (1757); fought at Plassey in the same year; took Pondicherry in 1761; became commander-in-chief in India (1769), and defeated Hyder Ali in 1781. D. Apr. 26, 1783. His nephew, of the same name, served against the Americans in the Revolutionary war.

Copacabana: See Titicaca.

Copaiba (kō-pay'ba), or **Copaiva** (kō-pay'va), **Balsam of** [*copaiba* is of Brazilian origin]: a stimulant, diuretic, oleo-resinous drug, which has decided value in diseases of the mucous membrane; is obtained chiefly from Pará in Brazil, though the trees which produce it grow extensively in many parts of tropical America. These trees are of many species or varieties, belonging to the genus *Copaifera* and the family *Leguminosæ* and sub-family *Cæsalpinia*.

Copa'is (in Gr. Κωπαΐς): the ancient name of a lake of Bœotia, now called **Topolias**. It receives the river Gavrios, the ancient Cephissus. The extent of the lake varies at different seasons, and in summer it nearly all disappears. It is drained by artificial and natural subterranean channels into the sea. The lake is, indeed, simply formed by the circumstance that the subterranean channels are not always capable of carrying away the volume of water which the Cephissus and its affluents bring down into the basin. It was once famous for its eels.

Co'pal [of Mexican origin]: a name applied to several resins used in preparing varnishes. The copal of commerce is usually a nearly colorless, translucent substance, which is

imported from tropical America, India, and Eastern and Western Africa. The American copal comes from leguminous trees of the genus *Hymenæa* and allied genera. Zanzibar copal is the best. It is from *Trachylobium hornmannianum*.

Copan': a ruined city of Central America: in Honduras; on the Copan river; about 30 miles E. of Chiquimula (see map of Central America, ref. 4–E). It forms a rectangular area 1,600 feet long by 900 broad. It is surrounded by walls, and contains within a temple, a number of obelisks and idols, and blocks on which Maya hieroglyphs are inscribed. See CENTRAL AMERICAN ANTIQUITIES and INDIANS OF CENTRAL AMERICA. See also Stephens, *Central America*.

Copartnership: See PARTNERSHIP.

Cope [a variant of *cape*: Lat. *cappa*, covering for head]: a sacerdotal cloak reaching from the neck to the ankles, and open in front. It appears to have been modeled by Pope Stephen in 286, on the Roman *lacerna*, or hood. It is one of the vestments of the English Church, but is now seldom worn. See VESTMENTS, ECCLESIASTICAL.

Cope, CHARLES WEST: historical and portrait painter; b. in Leeds, England, in 1811. Pupil of his father, Charles Cope, landscape-painter, and of the Royal Academy, London. Royal Academician 1848; celebrated as an etcher. D. Aug. 21, 1890.

Cope, EDWARD DRINKER: naturalist; b. in Philadelphia, Pa., July 28, 1840; grandson of Thomas P. Cope; early distinguished himself in herpetology: Professor of Natural Sciences in Haverford College 1864–67; Professor of Geology in the University of Pennsylvania from 1889 till his death in Philadelphia, Apr. 12, 1897. He was for many years editor-in-chief of the *American Naturalist;* author of numerous contributions to the *Proceedings of the Academy of Natural Sciences of Philadelphia, Transactions of the American Philosophical Society, American Journal of Morphology*, etc. Among his more important works are *Primary Groups of Batrachia Anura* (1865); *Systematic Arrangement of the Lacertilia and Ophidia and of the Class Reptilia* (1854–70); *Systematic Relations of the Fishes* (1871); *The Mechanical Causes of the Origin of the Hard Parts of the Mammalia* (1889); *The Origin of the Fittest*; *The Batrachia of North America*; *The Vertebrata of the Cretaceous of the West*; *The Vertebrate Paleontology of New Mexico*; and the *Tertiary Vertebrata of the West*. Prof. Cope discovered almost 1,000 species of extinct and nearly as many recent species of vertebrata. He was attached as paleontologist to the U. S. geological surveys under Hayden and Wheeler. D. in Philadelphia, Feb. 17, 1897.

Cope, THOMAS PYM: a distinguished merchant of Philadelphia; b. in Lancaster co., Pa., in 1768. He commenced business in Philadelphia in 1790, and in 1821 established the first line of packets between that city and Liverpool. To his energy Philadelphia was chiefly indebted for the supply of water from the Schuylkill and for the establishment of the Mercantile Library. He was a member of the Society of Friends. D. Nov. 22, 1854.

Copec', or **Copeck'**, or **Kopeck'**: a Russian coin; the first ever used in that country as currency. The copecs were originally made of silver, but copper copecs were afterward coined. The copec in use at present is made of bronze. As the ruble equals 100 copecs, the value of the copec varies with that of the ruble.

Copehan Indians [from *kapai*, a Kope word signifying stream or river]: a linguistic family of North American Indians which occupies that portion of Northwestern California bounded on the N. by Mt. Shasta and the country of the Sastean, Qnoratean, and Chimarikan Indians, on the E. by the territory of the Palaihnihan, Yanan, and Pujunan, and on the S. by the bays of San Pablo and Suisun and the lower waters of the Sacramento. The western boundary begins at the northernmost point of San Pablo Bay, trends northwestward in an irregular line to John's Peak, from which point it follows the Coast Range to the upper waters of Cottonwood creek, thence to the W., crossing the head-waters of the Trinity and ending at the southern boundary of the Sastean family. (See map under INDIANS OF NORTH AMERICA.) It embraces two main divisions—the Patwin and Wintu, with their numerous small tribes. The name Patwin signifies man, person. The habitat of this division extends from Stony creek, a western tributary of Sacramento river, southward to the southern boundary of the family. They live beside the watercourses, except during limited periods in winter, when they establish hunting-camps on the plains and along the edge of the tule swamp for the purpose of snaring the numerous wild fowl. Following are the principal Patwin tribes: Chenposel, on lower Cache creek, Yolo County; Kornsi, at Colusa, Colusa County; Liwaito, on Puta creek, near the foothills, Napa County; Lolsel, in Lone valley, E. of Clear Lake, Lake County; Makhelchel, on eastern side of Clear Lake; Malaka, in Lagoon valley, Solano County; Napa, in valley and county of same name; Olelato, on Ulatus creek, Lake County; Suisun, on Suisun bay, Solano County; Topaidisel, at Knight's Landing, Yolo County; Waikosel, in Cortina valley, Colusa County; Wailaksel, on Middle Cache creek, Colusa County; Yodetabi, at Knight's Landing, Yolo County; Yolo (Pop. 45 in 1884), in Yolo County.

The name Wintu signifies Indians, or people, more strictly "the people," and is the name which the tribes comprising this division apply to themselves. Their territory extends from Stony creek northward as far as Mt. Shasta, embracing the upper Sacramento and upper Trinity valleys. Branches of this division were settled in 1876–77 in Yreka and in Inyo County, and a small colony had wandered as far as Huerfano Park, Colorado. The tribes of the Wintu division are Daupom, of Cottonwood valley, Shasta County; Nomlaki, on Stony, Thomas, and Elder creeks, Colusa and Tehama Counties; Normuk, on Hay Fork, Trinity County; Nuimok, on Lower Stony creek, Colusa County; Nummuk, on a tributary of the Cottonwood, in Shasta County; Tien-Tien, on Hay Fork, Trinity County; Waikenmuk, on the upper Trinity, Trinity County. Wailaki is a general term used by the Norbo to designate all the Wintu N. of them.

The general characteristics of the two divisions are nearly the same. Physically, the Patwin have broadly ovoid faces, low, very wide foreheads, large eyes, straight noses, exceedingly depressed at the root, and with prominent nostrils. Their heads are quite small, and covered with a coarse shock of hair, and the skin varies from brassy and hazel almost to black. The young women are of small frame and comely. In youth all of the Patwin are excessively obese, but the aged are hideously wrinkled and repulsive. The Wintu, particularly the mountaineers, are generally larger in stature.

On the plains the Patwin men and all children up to ten or twelve years of age formerly went entirely nude, while the women wore only a narrow slip of deerskin around the waist. In the mountains, however, the Patwin and Wintu women wore short petticoats made of cottonwood bark, which were sometimes fringed and ornamented with pine-nuts and shells. The Wintu women ornament their faces, and sometimes the abdomen and breast, by tattooing. In the plains the Patwin live in dome-shaped houses of branches and earth, the floors of which are about 2 feet below the surrounding surface; but in the mountains, where wood is more abundant, lodges are constructed without the use of earth, two or three families frequently occupying a single lodge. The Wintu lodges differ from those of the Patwin, in that they are sharply conical, and are composed of bark and poles.

All of the Copehan tribes are indifferent hunters, but expert fishermen, salmon forming one of the chief articles of subsistence, although in season wild fowl and other game, clover blossoms, roots, bark, piñon nuts, acorns, berries, and a number of farinaceous seeds (including wild oats and sunflower seeds), and even vermin, contribute largely to their maintenance. For superstitious reasons they do not eat the grizzly bear.

Little is known of the religion of these tribes. They celebrate by dances an abundant harvest of acorns or a plentiful catch of fish. They have other ceremonials, one of which, performed by the Patwin, is for "raising the dead," in early times used for keeping the women in subjection. The Wintu have a number of ceremonials, among which may be mentioned the puberty, gift, and scalp dances. Others of a social nature are also performed.

In war the Patwin employed bows and arrows and flint-pointed spears, and often displayed much bravery. Besides these implements the Wintu use the sling-shot with great skill. Scalps were not taken by the Patwin nor by the Tien-Tien, a Wintu tribe; but, when victors, the former often decapitated a young female captive, the head being held aloft as a target to taunt and exasperate the vanquished. Duels were sometimes fought by men with bows and arrows at long range.

Marriage is generally by purchase. The Wintu are polygamists, and their marital relations are loose and easily sundered.

The healing art is practiced by shamans, sucking and bleeding, combined with various superstitious practices, forming the modes of treatment of patients, from whom large fees are extorted.

Among the Patwin, motherless infants were shaken to death in skins or blankets, and a mother occasionally killed her own babe when deserted by her husband and having no relatives; for, it is said, the sentiment that the men must support the women is very strong among the tribes of this division. Wintu children have been known to be buried alive with their dead mothers.

A widow wears tar on her head and face as long as she is in mourning—sometimes two or three years, sometimes as many weeks. Only when she removes it is it understood she wishes to remarry.

Most of the Patwin tribes bury their dead, but some practice cremation. Among the Wintu a dead person is doubled up, wrapped into a ball with grass ropes, skins, etc., and interred with as many of his former possessions as possible, the remainder being burned. The names of the dead are never mentioned.

Of the present population nothing is known. Prior to the advent of the whites, most of the Copehan tribes were comparatively populous. In 1849 Gen. Bidwell stated that the village of the Kornsi, a Patwin tribe, contained at least 1,000 souls. Whether the other tribes were proportionately numerous is not known. They are now diminished and scattered.

Authorities.—Stephen Powers, *Tribes of Cala, Contributions to N. A. Ethn.*, vol. iii., pp. 218–242 (Washington, 1877); H. H. Bancroft, *History of California*, vols. i.–vii. (San Francisco, 1884–90). See Indians of North America.

F. W. Hodge.

Copenha'gen: the capital and only fortress of Denmark; situated on the east coast of Seeland on the Sound; in lat. 55° 40′ N., lon. 12° 34′ 7″ E. (see map of Europe, ref. 4-E). The narrow strait separating it from the island of Amager forms a splendid harbor. Besides four suburbs, the city consists of three divisions surrounded by fortifications—the old city, lying to the west, the beautiful new city lying to the northwest, and Christianshaven to the south on Amager island. There are within the walls sixteen squares and market-places, of which the most remarkable is the New King's Market, with an equestrian statue of Christian V. Among the most important buildings are the Church of Our Lady, a plain structure in Græco-Roman style, which is, however, adorned with numerous masterpieces by Thorwaldsen; Trinity church, adjoining which is the Round Tower, about 125 feet high, ascended by an interior spiral path of easy grade, up which Peter the Great of Russia once rode on horseback while his wife was drawn up in a four-horse carriage; the Royal Palace of Christiansborg, which also served formerly as a House of Parliament, but was unfortunately destroyed by a conflagration on Oct. 3 and 4, 1884, which left only the bare walls standing; the Amalienborg, four similar palaces surrounding a square, in the midst of which is the equestrian statue of Frederick IV., occupied at present by the royal family and the Minister of Foreign Affairs; the Castle of Rosenborg, surrounded by a beautiful park and royal gardens, a structure of notable architecture; and the Royal theater, on the New King's Market, a stately building erected by the architects Dahlerup and Hansen, adorned at the entrance with bronze statues of the poets Holberg and Oehlenschlaeger. The chief object of interest to travelers is doubtless the Thorwaldsen Museum, a unique structure, not only in its form, but also in the fact that it contains only the works of the artist whose name it bears. The entire building is a regular polygon built in the style of the antique mausoleum about an inner court, in the midst of which is the grave of the great artist. The building contains 80 statues, 130 busts, and 225 works in relief executed by the hand of Thorwaldsen, over 100 of the works being in marble. The Museum of Northern Antiquities, founded in 1807, contains a notable collection of articles of the stone, bronze, and ice periods. The University of Copenhagen, founded in 1479, has a strong faculty, and about 1,000 students and a library of some 250,000 volumes. Copenhagen is the literary, artistic, and intellectual center of Denmark, as well as its industrial and political capital. The theater is in the fullest sense a national theater, and receives state support. Numerous learned societies find their home here. The city presents an active, bustling, attractive appearance, marred only by the somber ruins of the Christiansborg. With the increase of travel to Norway the number of visitors to Copenhagen increases every year. The manufactories of Copenhagen are of considerable importance, but its commerce is its main support. About 12,000 vessels enter and clear the port each year. Copenhagen was constituted a free port Sept. 1, 1894. The position of Copenhagen between two seas gives it great commercial advantages. Regular lines ply from this port to the ports of the Baltic and to Norway, while the Thingvalla line for the U. S. touches here. As early as 800 Copenhagen was a well-known trading-point. Bishop Absalon built a fort here in the twelfth century on the site of the present castle of Christiansborg to protect the place against the pirates. In 1443 King Christopher, the Bavarian, chose Copenhagen for the royal capital. The city has undergone several sieges, most important being those by Charles X. of Sweden, 1658–60, when by its resistance it saved the independence of the Danish monarchy; by the English in 1807 (Sept. 2–5), when a large part of the city was destroyed, and the English, after the surrender, carried away the fleet. In 1801 the great but indecisive battle between Nelson and Olfer Fischer was fought near Copenhagen. Pop. (1890) 312,859; with suburbs, 375,251.

C. H. Thurber.

Copep'oda: a group of entomostracan crustacea of very different appearances, accordingly as they are free swimming or parasitic. All in the young stages pass through a nauplius (see Crustacea) and a cyclops-like stage, and some remain in the latter condition throughout life. In the cyclops condition they have an anterior unsegmented region (cephalothorax) and a jointed abdomen. There is a double eye in front, two pairs of large feelers or antennæ used in locomotion, and four or five pairs of locomotor feet on the cephalothorax. The eggs are carried in a sac on either side of the base of the abdomen. Two tribes are recognized: (1) Gnathostoma, embracing normal forms which are free swimming and which have the mouth parts fitted for biting; (2) Siphonostoma, in which the mouth parts are fitted for piercing and sucking. The Siphonostoma are all parasitic, and in many degeneration has proceeded so far that were the life history unknown one would scarcely think of the adults as being crustaceans, but would rather regard them as worms. Both parasitic and free forms occur in salt and fresh water, and many hundred species are known.

J. S. Kingsley.

Copernican System: that theory of the system of the world which represents the sun to be a fixed body, and the earth one of a system of bodies called planets which move around it. Hence it is known also as the *heliocentric system*. It derives its name from Copernicus (*q. v.*), who attributes it to certain ancient philosophers, especially the disciples of Pythagoras. The subject is not alluded to in the Almagest of Ptolemy, although the motion of the earth on its axis is spoken of as a hypothesis which had been propounded. On the whole, there is no epoch-making theory more completely the work of one man than this. Copernicus probably claimed no credit because in his age it was considered rash to propound a view in opposition to long received theories.

Coper'nicus (the Latinized form of **Kopernigk**), Nicolas: a celebrated astronomer; b. at Thorn, in Poland, Feb. 19 (O. S.), 1473. His father, a Polish merchant from Cracow, died early, leaving his children in the care of Lucas Watzelrode, their maternal uncle, who became Bishop of Ermeland in 1489. Nicolas studied in the high school of his town, and then in the University of Cracow. He applied himself eagerly to mathematics under Albert Brudzevski for four years, and then went to Italy, visiting first Bologna, where Dominico Maria taught astronomy, and afterward Padua, where he became doctor of medicine in 1499. He became intimate with Regiomontanus. Through his uncle he was appointed canon in Frauenburg 1499. He remained in Italy until 1503, and was Professor of Mathematics at Rome in 1501. He then entered upon his office of canon, and is found (1517–19) intrusted with the conduct of the episcopal possessions in Allenstein, and on other occasions ably conducting the cathedral's concerns. He never refused the poor his advice and care as physician. His great discovery, that the planets move around the sun, he spent many years in observations and calculations in order to verify. It was Copernicus's idea by a comparative study of the various astronomical systems of the ancients to develop a new system containing all the truth of the others, but

none of their errors. The Egyptians held that Mercury and Venus revolved around the sun, but they also held that the sun, with Mars, Jupiter, and Saturn, revolved around the earth. Most of the philosophers, however, of the Pythagorean school held that the sun was the center of the universe, and Heraclides and Nuetas even went so far as to explain the phenomena of the rising and the setting of the stars from a daily rotation of the earth around its own axis. From these various systems Copernicus drew his materials, the careful digestion of which finally led to his great discovery, which he expounded in his work *De Orbium Celestium Revolutionibus*, finished in 1530, but not published until 1543, from a fear of persecution. He dedicated his book to the pope, and cautiously propounded his system as a mere hypothesis. According to tradition, he received the first copy of his book on the day that he died. It was published in Nuremberg (1543), in Basel (1566), and in Amsterdam (1617). His theory was rejected not only by the clergy, but by astronomers. "The whole weight of Aristotle's name," says Hallam, "which in the sixteenth century not only biased the judgment, but engaged the passions, connected as it was with general orthodoxy and preservation of established systems, was thrown into the scale against Copernicus." D. at Frauenburg, 42 miles S. W. of Königsberg, Prussia, May 24, 1543. See *Life of Copernicus* by L. Prowe (2 vols., Berlin, 1883–84).

Copiapó (in full, *San Francisco de la Selva de Copiapó*): a city of Chili; capital of the province of Atacama; on the western base of the Andes, at an elevation of 1,300 feet, and 30 miles from the Pacific (see map of South America, ref. 7–C). It is watered by the little river Copiapó, which dries up before reaching the sea; the surrounding region is a desert, and in the town itself rain hardly ever falls. The average temperature in summer is about 67° F., and in winter 51°. Copiapó was founded in 1707 near some gold mines, taking its name from the Copayapu Indians of the vicinity. It was mainly a military and transport station until 1832, when rich silver mines were discovered in the vicinity; these now yield about $6,000,000 annually. A railroad from Copiapó to the port of Caldera has branches to the mines, and it is proposed to continue it over the Andes. Pop. (1895) 9,301. HERBERT H. SMITH.

Copinger, WALTER ARTHUR: See the Appendix.

Copley, JOHN SINGLETON: portrait and figure painter; b. in Boston, July 3, 1737; d. in London, Sept. 9, 1815. He began to paint early in life, and received some instruction from his stepfather, Peter Pelham, a well-known painter and engraver. He began to paint portraits in Boston about 1751, but his work had little artistic merit. He improved, however, as he went on, and a portrait exhibited in London in 1760 received praise from Benjamin West and other artists. He went abroad in 1774, settled in London in 1776, and was made a Royal Academician in 1779. He continued to paint portraits and pictures of historical subjects, and achieved a wide reputation. His work is very interesting to Americans, from the fact that he painted the portraits of numerous celebrities of the Revolutionary period. One of the best of his works is a family group now owned in Boston, and one of his best portraits is that of Mrs. D. D. Rogers, owned by H. B. Rogers, Boston. A fine portrait, that of Ralph Izard and Mrs. Izard, belongs to Dr. G. E. Manigault, Charleston, S. C. It was painted in Rome in 1774. WILLIAM A. COFFIN.

Coppée, kop'pā', FRANÇOIS ÉDOUARD JOACHIM: poet; b. in Paris, Jan. 12, 1842; began in 1866 to publish poems in the *Parnasse contemporain*. The same year he brought out *Le Reliquaire*, a collection all his own. In 1868 appeared *Intimités*, another collection; in 1869 *Poèmes modernes*. His first great success, however, was the comedy *Le Passant*, acted at the Odéon in 1869. During and after the Franco-German war M. Coppée vehemently espoused the cause of his country, and by poems and plays strove to encourage the French to heroic deeds. He became a member of the Académie Française Feb. 21, 1884. Among Coppée's collections of verse, the following are notable: *Les Humbles* (1872); *Le Cahier Rouge* (1874); *Les Mois* (1876); *Récits et élégies* (1878); *Contes en vers et poésies diverses* (1881); *Poèmes et récits* (1885). Among his plays: *L'Abandonnée* (1871); *Fais ce que dois* (1871); *Les Bijoux de la déliverance* (1872); *Le Luthier de Crémone* (1876); *Madame de Maintenon* (1881); *Severo Torelli* (1883); *Les Jacobites* (1885). Coppée's collected works have been published in six volumes (1883–85). See Jules Claretie, *François Coppée*, in the series Célébrités Contemporaines; M. de Lescure, *F. Coppée, l'homme, la vie, l'œuvre* (1889). A. R. MARSH.

Coppée. HENRY, LL. D.: soldier and author; b. in Savannah, Ga., Oct. 15, 1821; graduated at West Point 1845; was lieutenant of artillery till he resigned, June 30, 1855. He served in the war with Mexico 1846–48; engaged at Vera Cruz, Cerro Gordo, La Hoya, Contreras, and Churubusco (brevet captain). Chapultepec, and the city of Mexico, and as assistant professor at the Military Academy 1848–49, 1850–55. Professor of English Literature and History in the University of Pennsylvania 1855–56; author of *Elements of Logic* (1858) and of *Rhetoric* (1859), of *Grant and his Campaigns* (1866) and of several military works 1858–73; editor of a *Gallery of Famous Poets* (1858), of *Distinguished Poetesses* (1861), and of the *United Service Magazine* (1864–66); contributor to the principal reviews and magazines of the U. S. 1848–73; compiler of *Songs of Praise in the Christian Centuries* (1866); president of Lehigh University, Bethlehem, Pa., 1866–75, resigning the presidency in the latter year, but retaining a chair in the college which he held until his death, Mar. 21, 1895.

Copper (in Lat. *cuprum*): an elementary metallic substance, known at a very early period. Before iron was used it was the principal ingredient in domestic utensils and weapons of war. The Romans obtained the best copper from the island of Cyprus, whence its Latin name, *cuprum*, was derived. Copper is distinguished from all other metals by its peculiar reddish color. It is very ductile and malleable, and requires a temperature somewhat lower than gold, but higher than silver (estimated above 2,000° F.), for its fusion. Next to silver, it is the best-known conductor of electricity, being in the pure state 93·08, while silver is 100. The specific gravity of copper is between 8·91 and 8·95; atomic weight, 63·5; its symbol is Cu. It is very hard, elastic and tough, with a tenacity only less than that of iron. It crystallizes in the regular system, forming cubes, octahedrons, etc. The principal ores of copper, besides the native metal, are the sulphides of copper, either alone or combined with other metals, such as copper glance (Cu_2S), indigo copper (CuS), copper pyrites (Cu_2S,Fe_2S_3), variegated copper ore ($3Cu_2S,Fe_2S_3$); Fahl ores, containing admixtures of sulphides of copper, iron, zinc, silver, mercury, etc.; enargite, containing sulphides of copper and arsenic; oxidized copper ores, such as red copper (Cu_2O) and black oxide of copper; and copper salts, such as malachite (which is carbonate of copper), silicate of copper, dioptase, chloride of copper, atacamite, phosphate of copper, and arseniate of copper. All these ores contain copper; it is found also in small quantities in most soils, in seaweed, and in the animal body. Copper forms two oxides, the protoxide (CuO) and the suboxide (Cu_2O); the former is found native in dark steel-gray crystals, with a specific gravity of 5·9; the latter occurs in red translucent crystals, having a specific gravity of 5·8; prepared artificially, it forms a beautiful crimson powder. Protochloride of copper is brown in the anhydrous state, and green when hydrated; it is very soluble in water. There are several sulphides of copper, the principal being the protosulphide and the disulphide, corresponding in composition to the two oxides. They are both found native, and are worked as copper ores. The carbonate of copper is sold as a pigment under the name of blue verditer, and from the subchloride of copper Brunswick green is obtained. The blue and green verdigris of commerce are made by the action of acetic acid upon oxide of copper. The blue vitriol so extensively used in dyeing and calico-printing is sulphate of copper. The alloys of copper are of great value. Brass is copper alloyed with from 28 to 34 per cent. of zinc; gunmetal consists of 90 parts of copper and 10 of tin; bell and speculum metals contain a large proportion of tin. Bronze is sometimes made of 91 parts of copper, 2 parts of tin, 6 parts of zinc, and 1 part of lead. When exposed to the air bronze becomes covered with a green coating of basic copper carbonate, which protects it from further action. This coating is now generally produced artificially by a variety of methods, as by washing the surface with a solution of salts and acids. Alloys with aluminium containing the constituents in widely different proportions are made. That with 3 per cent. aluminium is whiter than aluminium, the color being more like that of silver. An alloy of copper containing 5 to 10 per cent. aluminium has a color resembling that of gold. This is very hard and elastic, and is known as aluminium bronze. It is now used considerably in the manufacture of ornamental and useful articles. German silver consists

of copper, zinc, and nickel. Metallic copper is of very great value in the arts, being especially valuable for ships' sheathing and bolts, and is also the material used in the manufacture of a great variety of wares. The development of electric lighting and the transmission of power and of speech have led to an enormous increase in the consumption of copper, chiefly in the form of wire.

Copper is found in every quarter of the world. It exists in great quantity on the shores of Lake Superior. The U. S. has reached the position of being the greatest producer of copper in the world, and has become one of the largest contributors to the world's markets. The following table shows the growth of the industry, the unit being the gross ton:

COUNTRIES.	1882.	1889.	1899.
Europe:			
Great Britain	3,464	905	550
Spain and Portugal	38,774	54,270	52,617
Germany	15,088	17,356	23,460
Other European countries	12,475	9,082	14,925
North America:			
United States	40,467	101,239	253,870
Other countries	2,401	9,435	28,766
South America:			
Chili	42,909	24,250	25,000
Other countries	8,199	7,733	7,730
Africa	6,316	7,860	6,490
Asia (Japan)	2,800	16,125	27,560
Australasia	.....	11,582	17,900
Totals	177,853	259,837	458,421

The production of the different States and Territories was as follows, according to the statistics collected by the U. S. Geological Survey, in pounds:

STATES AND TERRITORIES.	1889.	1899.
Michigan	88,175,675	147,400,338
Montana	98,222,444	225,126,855
Arizona	31,586,185	133,054,860
New Mexico	3,686,137	3,935,441
California	151,505	26,221,897
Colorado	1,170,053	11,643,608
Utah	65,467	9,584,746
Wyoming	100,000	3,104,827
Nevada	26,420	556,775
Idaho	156,490	110,000
New England	72,000	4,427,574
Middle States	.....	
Southern States	18,144	
Lead desilverizers	3,345,442	3,500,000
Total domestic	226,775,962	568,666,921
From imported ores	5,190,252	23,800,000

Although copper-mining was carried on in colonial days to a very limited extent in Connecticut, New Jersey, and Pennsylvania, and the existence of native copper in Lake Superior, Mich., was known as early as 1660 to the Jesuits, it was not until 1844 that systematic mining was begun in Michigan. Active work was undertaken in Vermont in 1850, and at Ducktown, Tenn., in the same year, California following closely. From 1867 to 1881 between 80 and 90 per cent. of the copper product of the U. S. came from Lake Superior. Then simultaneously the facilities for transportation offered by the transcontinental routes led to the development of the deposits of Arizona and New Mexico on the one hand, and of Montana on the other. Now the three great districts of the country are that of Lake Superior, Butte, in Montana, and the Bisbee, Clifton, and Globe groups, in Arizona. On Lake Superior copper is found native in three distinct forms of deposit. The "mass" veins, in which metallic copper has been found in masses, often of enormous extent, were the chief reliance of early mining. They are now reduced to a very insignificant position. The largest masses discovered were one of 500 tons at the Minesota mine, and a series of related masses in the Central mine which yielded about 1,200 tons. The second form of deposits are the ashbeds or amygdaloids, and the third the conglomerate beds, the latter being now the greatest producers. The metallic copper occurs in nodules, shot and sheets distributed through the beds, the rock yielding about 4 per cent. of copper in the Calumet and Hecla and as low as 0·75 per cent. in the Atlantic mine. The copper rock is crushed under large steam-stamps of the Ball and Leavitt types, and is washed in jigs and buddles, the concentrated product, called "mineral," carrying from 30 to 90 per cent. of metallic copper, being smelted and refined at one fusion.

The copper veins of Butte, Mon., occur in granite, carrying copper glance, peacock copper, and some copper pyrites. They have yielded enormous quantities of ore containing from 20 to 35 per cent. of copper, but the chief reliance of the producers are the low-grade ores which yield from 5 to 10 per cent. Practically all the ores carry some silver, the yield in some instances being relatively high. The ores must be concentrated by crushing and washing. The concentrates so obtained are roasted (i. e. deprived of the greater part of their sulphur contents), in stalls or Brueckner or O'Hara furnaces. The roasted ore is smelted in reverberatory or shaft furnaces to produce a "matte," a compound of copper, iron, and sulphur, carrying about 50 to 65 per cent. of copper. This "matte," generally argentiferous, is either shipped to Eastern or European smelters and refiners or is worked on the spot. Modern practice is to melt the matte in cupolas, tap it into Bessemer converters, expel the sulphur and arsenic by the Manhès pneumatic process, the product being an argentiferous metallic copper. The latter is cast into flat cakes called "anodes," and is worked by electrolysis, pure copper being deposited by an electric current in acidulated sulphate of copper solution on the cathodes, while silver and gold are gathered as a brown mud. The copper is smelted and refined, while the precious metals are parted in the usual manner. The methods followed at Butte may be regarded as typical of modern processes for the extraction of copper from complex sulphuretted copper ores.

The third important source of supply of copper in the U. S. are the deposits of oxidized ores of Arizona, the metal coming, with insignificant exceptions, from the three districts of Clifton, Bisbee, and Globe. The ore occurs in or adjacent to carboniferous limestones, and carries oxides and carbonates of copper. The bulk of the ore is hand-sorted, and is smelted with coke as a fuel in water-jacketed blast furnaces by a single fusion into bars of 96 per cent. standard, which are refined on the Atlantic seaboard, producing a high grade of copper. The smelting in Arizona is typical of advanced practice in the working of oxidized ores.

The report of the census (1890) showed that the cost of mining 3,322,742 net tons of ore, yielding 220,569,438 lb. of copper, was $12,062,180, including $6,096,025 for wages to 8,721 employees, $4,067,970 for supplies, and $1,442,846 for rent, taxes, etc. The cost of crushing 2,137,653 tons of ore in Lake Superior stamp-mills was $985,595.11, while the cost of concentrating and smelting Montana copper ores, producing 102,188,716 lb. of copper in matte and blister was $6,297,538.59. The outlays for smelting Arizona ore yielding 31,362,685 lb. of copper were $1,257,892.87. In refining, $1,885,261 was spent to produce 159,693,252 lb. of refined copper.

Although it constitutes only a fraction of the copper product in the U. S., the amount of metal obtained from cupriferous pyrites is an important source of supply in other countries, notably Spain and Portugal. The pyrites deposits of the Peninsula, which were worked by the Romans, are enormous bodies carrying from 2 to 3·5 per cent. of copper. The ore is either worked on the spot by roasting in open heaps, leaching with water, and precipitating with scrap iron, or by the more modern Deutsch process, or it is shipped to England and the Continent to be first burnt in calciners. The sulphurous acid from the calciners is utilized in the manufacture of sulphuric acid, largely to serve as a raw material in the older Leblanc process of soda manufacture. The residue, which contains the copper and small amounts of the precious metals, is calcined with an admixture of salt, which renders the copper soluble as chloride, from which solution it is deposited by scrap iron. The residue from the leaching out of the copper salts is an oxide of iron, known in England as "blue billy," which is utilized as a fettling in the puddling of pig iron or as an iron ore in the blast furnace. CHARLES KIRCHHOFF.

Copperas: the commercial name of the hydrated protosulphate of iron, sometimes called "green vitriol." It is composed of 28·9 per cent. of sulphuric acid, 25·7 of protoxide of iron, and 45·4 of water. It is used in medicine, in the dyeing of black, and in the manufacture of ink.

Copperhead: a venomous serpent of the rattlesnake family (*Ancistrodon contortrix*) furnished with loral plates on the head, but without rattles. When full grown it is about 3 feet long, of a light-copper color, with darker transverse bars. It has many local names, is nowhere abundant, but is more common in the Southern than in the Northern States. Its bite is much dreaded and often fatal.

Copperhead: any member of a party in the Northern States of America supposed to favor the secessionists dur-

ing the civil war. The epithet was given because this party was regarded as an insidious and secret foe to the Union.

Coppermine River: See the Appendix.

Copper River (native name *Atna*): a river of Alaska; rises in the mountains S. of the Tanana and empties into the North Pacific Ocean at about lat. 61°, lon. 145°. Its general direction is S., its length about 500 miles. An easy portage leads across the water parting between the Copper and Tanana. About 200 miles above the large delta, the river is joined from the E. by the Chittynia, which sends down copper in solution, from which the river derives its name.

Copper-smelting: See METALLURGY.

Coppinger, JOHN J.: See the Appendix.

Coprolite [from Gr. *κόπρος*, dung + suffix *-ite*]: the fossil excrement of animals. The term was originally applied by Dr. Buckland to certain deposits which he found in the lias, and determined to be the fæcal remains of the gigantic saurians of that period. The true coprolites of the lias are formed like kidney potatoes, of earthy texture, black or ash-gray color, and glassy fracture. They are twisted, showing the mark of the intestine, and frequently contain shells, fish scales and bones, or, more rarely, the bones of reptiles that were eaten by their larger relatives. The term coprolite has been extended in a commercial sense to include deposits of phosphatic rock containing large quantities of water-rolled, fossil bones of fishes and saurians, such as occur at the base of the Red Crag of Suffolk, England. The value of these minerals is derived from the phosphate of lime of which they are partly composed. It is used with great advantage as mineral manure, after having undergone cheap chemical treatment. It is converted into a soluble superphosphate by the action of sulphuric acid. The trade in Great Britain is of great importance, and the production large. Some specimens yield when washed and powdered over 85 per cent. of phosphates. The greensand varieties yield about 60 per cent. of phosphates. The annual yield of England is from 30,000 to 40,000 tons. These coprolites contain from 4 to 5 per cent. of organic matter and a little silica, but from 70 to 80 per cent. of their whole substance is a mixed phosphate and carbonate of lime. Extensive beds of phosphates occur in the Tertiary deposits of the Southern States, notably in South Carolina and Florida, and these contain many true coprolites mixed with other remains of vertebrates, especially of sharks, proboscidians, and cetaceans. The output of the South Carolina phosphate mines for 1889 was not far from 500,000 tons.

Revised by F. A. LUCAS.

Copse [*copse* is a variant of *coppice*, from O. Fr. *copeiz*, newly cut wood, probably connected with *colper*, *coper*, cut, and *colp* (> Mod. Fr. *coup*) < Lat. *colaphus* = Gr. *κόλαφος*, blow with the fist]: a name given in Great Britain to plantations of trees which are occasionally cut down for firewood, charcoal, or other purposes. There is considerable rough and rocky land in that country which yields more profit by devoting it to copse-wood than by any other plan. Hop-poles, hoops, tanner's bark, etc., are among the products of copses.

Coptic Church: the direct continuation of the old Christian Church in Egypt, which dates from the earliest Christian centuries. Egyptians listened to the preaching of Peter on the day of Pentecost. Alexandrians disputed with the martyr Stephen. Eusebius says that Mark, the author of the second Gospel, was the first Bishop of Egypt and had a large following. Since the bishopric of Dioscurus ceased, 452 A. D., monophysitism has been the tenet of the Copts. They have always detested the Council of Chalcedon (451). The Church retains the doctrine of transubstantiation, the practice of mariolatry and the confessional. In Upper Egypt the rite of circumcision has been retained, but in Lower Egypt it has been replaced by infant baptism. At the head of the Church is the patriarch, whose seat is now at Cairo. The names of 100 monks approved by the bishops and high priests are sent to the abbot of the monastery of St. Antony, and after being eliminated to three the patriarch is selected by lot. Under him are thirteen bishops and a high priest, besides priests whose duty it is to read the liturgy, but not to preach. Preaching in Coptic churches is unknown. There are also deacons, subdeacons, an archdeacon, readers, and precentors. Ordination performed by the patriarch and bishops is complete only after the use of the sacred oil, which, through the continued miracle of St. Mark, is never exhausted. They lay no claim to apostolic succession through the laying on of hands. The Coptic Church has been peculiarly exposed to persecution. Emirs vied with each other in the attempt to exterminate Christianity in Egypt. It is also a wonder that they have not become extinct through internal dissensions. Monophysites, Monothelites, Jacobites, Melchites, Phantasiasts, Eutychians, Acephali, Esaianites, Gaianites, Barsanuphians, Anthropomorphites, and Semidalites, now only names which perhaps excite a smile, are the epitaphs of so many wrangling sects that through centuries split the Coptic churches, murdered and drove Copts into deserts, caves, and dens. The Coptic Church is far from being in a state of peace. A party of reform among the laity is demanding that the large income of the Church, from the rents of bequeathed estates, now secretly appropriated by ecclesiastics, be managed on business principles; that Coptic schools be provided for Coptic children; and that steps be taken to secure a better educated ministry, who shall be paid a regular salary. In early times the Copts worshiped in Egyptian temples. Now they have their own churches, but, with exceptions, they are small and dirty. At Sunday services the men sit crosslegged on mats, or stand leaning on canes or crutches. At the close the congregation crowd around the priest, who lays his hand on the head of each in blessing. Their fasts are the "great fast" at Easter, fifty-two days, the fasts of Christmas, Whitsunday, and of the Ascension of Mary. During these only bread, onions, oil, and legumes are eaten. Neither the Coptic service nor the Coptic character is fitted to make any impression on Moslems favorable to Christianity. Efforts have therefore been made to infuse a better spirit among Coptic Christians. Since A. D. 1250 the Romish Church has had its Franciscan missionaries in Egypt. In 1781 Pius IV. established an apostolic vicarship at Cairo. The present vicar reports that he has 5,000 Coptic communicants and thirty-one native priests under him. The Church Missionary Society of England began work in Egypt in 1825, and the United Presbyterian Church of the U. S. in 1854.

AUTHORITIES.—Hansleb's *Histoire de l'Église d'Alexandrie fondée par S. Marc* (Paris, 1677); Makrizi's *Historia Coptorum Christianum* (ed. Wetzler, Sulzbach, 1828; translated by S. C. Malan, London, 1872); Renaudot's *Liturgiarum Orientalium Collectio*; also, same author, *Historia Patriarcharum Alexandrinorum* (Paris, 1713); Brugsch's *Der Bau des Tempels Salamo's nach der Koptische Bibelversion* (Leipzig, 1877); Révillout's *Apocryphes Coptes du Nouveau Testament* (Paris, 1876); de Lagarde's *Bruchstücke der Koptische Uebersetzung des Alten Testaments* (in his *Orientalia*, 1884); Luettke's *Ægyptens neue Zeit* (Leipzig, 1873); Fuller's *Coptic Church* (in Smith and Wace's *Dictionary of Christian Biography*, Boston, 1877); and Butler's *The Ancient Coptic Churches of Egypt* (Oxford, 1884).

LYSANDER DICKERMANN.

Coptic Language and Literature: Coptic was the language of the Egyptian Christians. It was written with the aid of thirty-one letters—twenty-five in the Greek uncial form, six derived from hieroglyphic or demotic prototypes. The date of its rise can not be given accurately, as it was a development from the ancient language through the demotic. All three forms of the language are consequently of importance in mutually explaining a multitude of words. From a form largely monosyllabic, Coptic developed into a thoroughly agglutinative tongue, expressing its grammatical elements by suffixes, prefixes, and combinations. Forms it scarcely possessed, and variations of meaning were expressed by changes of vocalization, so that phonology must form the basis of the Coptic grammatical system. The language became more flexible, precise, and adaptable than its parent, and its lack of forms was supplied by a wealth of periphrase. The formation of its words and sentences is clear, and its vowel changes are of remarkable uniformity and regularity. Under Christian and Byzantine influence many Greek words, nouns, verbs, and particles were borrowed in a pure or adapted form, and were used side by side with the native synonyms. Latin and Persian words are also found, but none of Arabic origin. Coptic began to die out in the tenth and eleventh centuries, as is evidenced by the beginning of the production of works of a grammatical nature, in which the language is explained in a very imperfect way.

Coptic is known under several dialects, and the existence of others is suspected. The dialect of Upper Egypt was the oldest, usually called the Thebaic (better Sahidic, highland), and was spoken from Minyeh to Syene. The literature in it dates from between the third and seventh centuries,

and consists largely of annals written on parchment or papyrus. A large part of it lies unedited in Turin, Naples, Rome, and Oxford. A younger dialect which spread over the whole Delta region was the Memphitic (better Boheiric), containing a large proportion of all the Coptic literature which has come down to us, none being later than the ninth century. Nearly the whole Bible has been preserved in it. Between these two dialects was that of Middle Egypt (erroneously called the "Bashmuric"), which partook of the features of both. Its home appears to have been in the FAYÛM (*q. v.*). The whole of the Bible appears to have been rendered into this dialect, but only fragments of the translation are now extant. Another dialect was the "Bushmuric," spoken in the region of Lake Menzaleh, but it has left no memorials of itself. A careful comparison of the dialects is necessary in order to explain some forms otherwise unintelligible on account of their departure from the hieroglyphic originals. The dialectic variations are marked by preferences for certain letters, words, and forms, and by differences in vocalization. Though long dead the Boheiric is still used for liturgical purposes in the Coptic churches.

Most of the literature is biblical, theological, or ecclesiastical, comprising Gnostic works, lives of saints, apocryphal books, liturgies, etc. Some of the most noteworthy publications are mentioned below. Zoega's *Catalogus codicum copticorum* (Rome, 1810, fol.), containing biblical and patristic matter in all three dialects, is very valuable. Peyron's *Psalterium*; Woide's *Novum Testamentum* (Oxford, 1799, fol.); George's *Evang. Joannis* (Rome, 1789, 4to); Schwartze's *Pistis Sophia*, the famous Gnostic work (Berlin, 1851, 8vo); and Revillout's *Concile de Nice* (Paris, 1880, 8vo, and his *Papyrus Coptes* (in the *Etudes égyptologiques*, Paris, 1876), are all in Sahidic. Tuki's *Psalterion* (Rome, 1744, 4to: reprinted by the London Bible Society, 1826); Lagarde's *Psalterium* (1875, 4to); Tattam's Coptic and Arabic Gospels (London, 1847, fol.); and Révillout's *Apocryphes coptes du Nouveau Testament* (Paris, 1876), are in Boheiric. Budge's *Martyrdom and Miracles of St. George of Cappadocia* (London, 1888, 8vo) is partly in each dialect. Schmidt's *Gnostiche Schriften in koptischer Sprache aus dem Codex Brucianus* (in Gebhardt and Harnack's *Texte und Untersuchungen*, viii. 1–2) is a very valuable addition to the literature. The only Coptic grammar worthy of mention is that of Stern (*Koptische Grammatik*, Leipzig, 1880, 8vo), but it is essentially a grammar of biblical idiom only. The dictionary of Peyron (*Lexicon linguæ copticæ*, Turin, 1835, 4to) is the only one that is trustworthy; those of Tattam and Parthey are unreliable.

CHARLES R. GILLETT.

Coptos: See EGYPT, ANCIENT; also KOPTOS.

Copts [from Arabic *Ghubt* or *Khoobt*, a corruption of *Ha-Ka-Phtah*, the old Egyptian name of Memphis. The Greek corruption is Αἴγυπτος, whence Eng. *Egypt*]: a Christian people of Egypt, descended from the ancient inhabitants of that country, whose blood, however, is mingled with that of Greeks, Arabs, Nubians, etc. They trace their lineage back to the pyramid-builders, and in their slender limbs, high cheek-bones, thick lips, black eyes, and the absence of *embonpoint*, they do resemble the portraits on the monuments of the ancient Egyptians. Dean Stanley called them "the only living representative of the most venerable nation of antiquity." According to the census published by the Egyptian Government in 1869, the Copts numbered 500,000. Of these, 10,000 were said to live in Cairo. Entire villages in Upper Egypt are occupied by Copts, and their faces are common in the Fayûm. The ruins of Coptic churches thickly dotting the Delta and the Nile valley prove that they were once more numerous than now. By apostacy and marriage with Moslems they have long been decreasing. In customs, manners, language, and spirit, the Copt has become a Moslem from head to foot. He ridicules the Moslem mumbling his prayers with his face toward Mecca, but he repeats his own prayers and psalms in the same way with his face toward Jerusalem. At funerals the ceremonies are outwardly like those of the Arabs. A Coptic marriage consists of two parts: the betrothal and the coronation. These may or may not occur at the same time. At the betrothal two rings are blessed and exchanged. Except under peculiar circumstances, the coronation takes place at the church in the presence of priest and witnesses. The marriage robes are blessed, a white veil is held over the kneeling pair, they are anointed with oil, a crown and a cross are laid on the head of each, and prayers and blessings follow. According to the canon, the Eucharist should conclude the service. Divorce is legal only for adultery on the part of the wife, but, in consequence of the overshadowing influence of Moslem practice, divorces occur for other reasons. They dress like Arabs, except that the turban is grayish black or light brown, and they often wear a black coat or gown over their other dress. Coptic women veil their faces in public, and at home when male visitors are present. The Coptic record for honesty is not all that could be desired. Gibbon calls them "a race of illiterate beggars," but this hardly distinguishes them from the Moslems. Ammianus Marcellinus said: "They are false, faithless, and deceitful, but extremely useful as secretaries and accountants." Cyril said: "They are so sunk in darkness as hardly to know whether they believe or what they believe, but each one of them obstinately clings to his superstitions and errors." See Lane's *Modern Egyptians* (London, 1860); Malan's *History of the Copts* (London, 1872); Luettke's *Ægyptens neue Zeit.* (Leipzig, 1873).

LYSANDER DICKERMANN.

Cop'ula [Lat., bond, link; *co-*, together + root, *ap-* in *apis'ci*, attach itself to, *adipis'ci*, attain, *aptus*, suited]: in logic, that word or part of a statement which expresses a relation between the subject and the predicate. Thus in the sentence "Art is long," *is* is the copula connecting *art*, the subject, with *long*, the predicate.

Copyhold: a tenure of lands existing in Great Britain, founded upon immemorial custom. It is commonly said to have originated in a modification of the ancient villeinage by the commutation of base services into a fixed rent in money or money's worth, but this is not certain. A copyhold estate is a parcel of a manor, and is held according to the custom of that manor. Copyhold estates have been burdened with many inconveniences, such as the uncertainty of the customs on which the estate depends, restrictions on the cutting of timber and the mining of minerals, liability to arbitrary fines, etc., and to remedy these numerous statutes have been passed during the reign of Queen Victoria.

F. STURGES ALLEN.

Copyright: the exclusive right of the owner of an intellectual production to multiply and dispose of copies; literary property. It is a right afforded by the law for the protection of property in literary or artistic productions. The term is employed indifferently to signify the statutory and the common law right of property in such productions. Statutory copyright is sometimes called copyright after publication, while common-law copyright is copyright before publication. There is a difference of opinion as to whether copyright existed among the ancients. There is no mention of any such property in the Pandects, and no case in Roman law of any action having been brought to protect a right in literary property.

Statutory Copyright.—By this term is meant an exclusive right given by statutory law to an author or proprietor to multiply copies of his work and place them on sale, and in the case of a play the additional exclusive right of representation on the stage. Without this statutory protection the act of publication would be regarded by the courts as a dedication of the work to the public, and accordingly destructive of the author's right of property. The policy of the copyright law is to give the author, etc., protection in the sale of his work for a specified period, and then to throw its publication open to all. This theory is marked out in the U. S. Constitution, which gives power to Congress to secure to authors the exclusive right to their works for "limited times." The whole subject is under the control of Congress, and any legislation of a State affecting copyright would be inoperative and void. The result is that if an author does not choose to publish his right to his manuscript is perpetual, and may be vindicated in courts of law on general principles of justice; if he prefers to publish, he brings himself within the purview of the law of Congress, must have his right only for such time as the statute prescribes, and must seek his remedies exclusively in the U. S. courts.

In general, any thing may be copyrighted which is the subject of literary ownership. More specifically, the term "copyright," as used in the existing enactments of Congress, applies to books, maps, charts, dramatic or musical compositions, engravings, cuts, prints, photographs, and their negatives, paintings, drawings, chromos, statues, statuary, and models or designs intended to be perfected as works of the fine arts. The words "engraving," "cut," or "print,"

as here used, are to be applied only to works connected with the fine arts or to pictorial illustrations, and are not to be extended to prints or labels designed to be used for other articles of manufacture. These last may be registered in the Patent Office. In determining whether one of the above-named subjects can in a particular case be copyrighted, it is necessary to consider how far it must be original with the professed author. There are some compositions of such a high and elevated character that the question of originality can not be successfully raised. It is conceded by all mankind. On the other hand, there are other works of a much humbler sort, but still of a highly meritorious and useful nature, in which all the materials are existing in literature, and are well known to intelligent men, and open for resort to any one, and the only original feature is found in the selection, arrangement, or combination of materials. Instances of this kind are works on grammar, arithmetic, or geography, maps, charts, etc. These, so far as they are the result of the work of the compiler or "author," are the subjects of copyright. He has no claim, however, to the materials which he did not originate. Any other person may resort to them and prepare a work from them, but he must not make use of the copyrighted book as a mode of collecting his materials. His correct course is to resort to the original sources of information. An illustration of these principles may be found in the case of a law reporter. He can have no copyright in the opinions of the judges, as of these he is not the *author*, while he might lay claim to a statement of the facts of the case, as well as to an abstract of the decision prepared by himself. A translator of a foreign work not the subject of a copyright here may have a copyright, as he is for practical purposes an "author." Any other person may translate the same work, and have himself a copyright. It was even held under the former law that a person might have a copyright in the translation of a work copyrighted in the U. S., though such translation were made without the author's consent. This rule was applied to an unauthorized translation into German of Mrs. Beecher Stowe's well-known work, *Uncle Tom's Cabin*. This anomaly has been corrected by a change in the law which permits an author in taking out a copyright to reserve the right of translation as well as of dramatization of his own works. So in the case of music, the composition of a new air or melody is sufficiently original, but it must be substantially a new work, and not a copy of a piece already in existence, with only such variations as any skillful composer can make. Under these rules there can be no copyright in a subject, but only in a particular mode of treating it. For example, one can not obtain in this way an exclusive right to make maps of the city of New York, though he might acquire one in the results of his own labors and surveys. Any other person may make a like map from his own independent labors and surveys.

The word "book," as used in this class of laws, has a wide meaning. It is not restricted to volumes, but may include a single sheet. It has even been decided that for this purpose a sheet of paper containing diagrams representing a system of taking measures for and cutting ladies' dresses, with instructions for practical use, is a "book." There can be no copyright in a mere title as unconnected with a book. Where, however, a title is used to designate a work, particularly a periodical, it may become of great value, which will be administered by the courts under the law applicable to the "good-will" of trade in analogy to the rules appertaining to "trade-marks." See TRADE-MARKS.

There is a peculiarity to be noticed in the case of a copyright of a dramatic composition. In this case it is not merely an exclusive right to multiply copies for sale, but also to publicly perform or represent the play upon the stage. The term "dramatic composition," as thus used, includes all the parts which go to make up a scene in a theatrical representation—e. g. gestures, spoken words, etc. A character in a play who, according to the part assigned to him, goes through with a series of events without speaking, making use of motions and gestures, is as much an actor as one who uses his voice, and the one part must be regarded as embraced within the expression "dramatic composition" as well as the other. The only difference in the two parts is that the one addresses the eye and the other the ear of the spectator.

The property in a copyright is of an incorporeal nature. It can not, for example, be seized by a sheriff in the exercise of his common-law powers and sold on an execution. (See EXECUTION.) Should the sheriff, for instance, sell in this way a copperplate on which a copyrighted map was engraved, the purchaser would only acquire a title to the copperplate considered as a corporeal thing, with no right to print maps from it. The incorporeal right to publish maps could only be obtained in such a case through the action of a court of equity.

An applicant for a copyright in the U. S. must before publication deposit in the mail a printed copy of the title of the book, etc., or a description of the painting, drawing, etc., addressed to the librarian of Congress at Washington, and within ten days from the publication must also deposit two copies of the book itself, or in case of a painting, drawing, etc., a photograph of the same. Without these deposits the author or proprietor is not entitled to the copyright. A subsequent section of the law provides under a penalty that two copies of the *best* edition must be supplied, and that when any substantial change is made in a subsequent edition a copy of that must also be deposited. It is made by law the duty of the librarian of Congress, on payment of a fee, to make up and register as prescribed by law a formal statement (termed a "record") of the name of the book and the fact of the required deposit. No action can be maintained by a proprietor against an infringer unless the former has caused to be printed on the title-page or succeeding page of each copy of a book, or on the face of a map or photograph, a statement in a form prescribed by law of the fact of the entry in the librarian's office. The following brief statement may be used as an equivalent: "Copyrighted 18— by A. B." The regulations on this subject were much simplified by an act of Congress in 1870, the former law having required the record to be made in the district court of the U. S. of the district of the author's or proprietor's residence. A single office under the present law takes the place of a large number under the former system.

The term for which the copyright is granted in the first instance is twenty-eight years. If the author be then living, or be dead leaving a widow or children then living, there may be a renewal on complying with certain prescribed rules, for fourteen additional years. A copyright may be assigned by an instrument in writing. The assignment should be recorded within sixty days after its execution, or it will be void as against a subsequent assignee or mortgagee for a valuable consideration without notice. A simple assignment of an existing copyright does not carry with it the right of renewal.

The leading questions in the law of copyright concern infringement. The fact that a copyright is of an exclusive nature necessarily gives the proprietor a cause of action against one who infringes his right by placing copies on sale or reproducing on the stage his "dramatic composition." Infringement is a very plain matter when the copyrighted work is simply reproduced. It becomes a complicated and difficult question when only extracts or quotations are made, or when resort is had to the book to make the public acquainted with its contents or to criticise its style or the substance of its thought. It has long been established that the identity of a literary work consists in its ideas and its language. The thought is so associated with the form in which it is expressed that a copyright does not protect an author against the use of his thoughts in a substantially different form. It is for this reason that by general rules of law the unauthorized translation into another language or the dramatization of a copyrighted work is no infringement. Though the sentiment remains, the form is changed. On similar grounds a true abridgment, though made against the author's consent, is no infringement. This consists in a condensation of the author's language, and is substantially a different work. Where there is no such change it is an abuse of language to call the new work an "abridgment." The law as above stated has recently been modified by the express statutory provision, before referred to, allowing an author, if he see fit, to reserve the right of translation or dramatization. Dismissing these special cases of change of form from further consideration, it remains to inquire how far extracts or quotations may be made. When, for example, such quotations are made for the purpose of a review, the main inquiry is whether the act is a reasonable one as calculated to show the character of the original work. The critic must not go so far as to substantially publish the copyrighted work. The question thus becomes one of the *value* of the extracts made. This must be determined by the facts of each case. It has sometimes been thought that the true inquiry was whether there was an *intent* to infringe or steal. This is not satisfactory. The real point is has the author

sustained substantial injury. The same general rule must be applied to other cases where extracts are made. There is a marked distinction in this branch of the law between a true abridgment and a compilation. In the former, as has been seen, there is a real and substantial condensation of the materials, and this has been made with intellectual labor and judgment. In a compilation there is the act of taking the very words of the author, or with such slight changes as to show servile imitation. The law at most tolerates the condensation, and does not permit the copying of the author's words to such an extent as to do him substantial injury. Compilation is to some extent permitted in dictionaries, gazetteers, cyclopædias, guide-books, etc., where the main design and execution of the work are novel. In works of this class the materials must, to a considerable extent, be the same. Novelty and improvement in them in general consists in abridgment, changes in arrangement, more modern information, the correction of errors, etc. It is scarcely necessary to add that an infringement may take place by publishing but a small portion of a work, if that be a vital part and cause a substantial injury to the proprietor.

In the U. S. the remedies for the violation of a copyright are to be sought in the Federal courts, the circuit court under the acts of Congress having original jurisdiction. The regular remedies are an action for damages or an injunction from a court of equity preventing the continuance of the acts of infringement. As incidental to this relief, the court may direct an account to be taken of the profits realized by the infringer. The courts will not grant relief for an infringement in case the work copyrighted is immoral or libelous. This is expressly provided by the act of Congress, and the same doctrine without such a provision would be administered as a regular branch of equity jurisprudence. Where an infringement consists in making use of part of a copyrighted work in connection with other matter, the injunction will be so granted as to prevent the publication of that portion of the infringer's book which is open to objection, without reference to the fact that the order of the court may make the book, thus shorn of a portion of its contents, valueless. Severe penalties and forfeitures are also imposed by statute law upon persons who knowingly violate the provisions of the copyright acts.

Common-law Copyright.—This is the right of the owner of an intellectual production in his work before publication.

1. It can not be successfully disputed that if a person composes a literary work, and does not choose to publish it, he has as complete an ownership in it as if he had produced a watch or other chattel. Conceding that he has no vested right simply in his ideas, he does have a title to them considered in reference to the outward form in which they are clothed. Accordingly, the regular legal remedies for the violation of rights of property would be applicable, and the usual incidents of property would attach. Still, for special reasons, unpublished writings can not be taken by creditors in payment of debts. (*Bartlett* vs. *Crittenden*, 5 McLean, 32.) A decree of Louis XV. of France of May 21, 1749, in favor of the French tragic poet Crébillon (the produce of whose play while acting at the theater was taken for his debts), declaring that the productions of the mind are not among effects seizable by creditors, is noticed by the elder Disraeli as a high honor to literature. (*Curiosities of Literature*, ii., 192.) An owner of this kind of property can sell it or dispose of it by will, or it may pass to his representatives at his death in the ordinary course of succession. The effect of the act of addressing a letter by an author to a correspondent has been frequently considered by courts of justice. The result of the discussions is that while the author parts with the paper on which the letter is written, he still retains an ownership in the sentiments and expressions. By this divided ownership the receiver is entitled to the letter considered as an autograph, while if he publishes the contents he may be pursued by an action in court. The ownership of the receiver is corporeal, that of the author is incorporeal. The same result would happen if one should address in writing a poem or other literary work to a friend. A distinction between the ownership of the paper and of the poem would immediately spring up. Some jurists have confined the applicability of this rule to letters having a literary character. It is, however, believed that this distinction is not maintainable, and that in general a letter can not be published by its receiver or any other person without the consent of the author, unless it may be to vindicate the receiver's character or to subserve the ends of public justice.

One of the most important instances, in the practical administration of justice, of this form of literary property is an unpublished play. A composer of such a work may keep it absolutely to himself, and make it as completely his own as any other species of property. So he may by appropriate acts cause it to become common property and wholly abandon ownership. In such a case he is said to "dedicate" it to the public. The act of dedication must be distinct and unequivocal, and can not be presumed from the fact that he permits it to be exhibited on the stage in the ordinary manner. The most that can be claimed from such an exhibition is that any person having the right to attend upon it may carry away with him as much as he is able from his unassisted memory, and may thus by means of his memory reproduce the play upon the stage. As to the last branch of this proposition, even, there would seem to be some doubt, since it may be plausibly maintained that all that the author intends to concede to the hearer is the right to the personal enjoyment or instruction of the occasion. However this may be, it is clear that there is no implied license to the audience to take notes, and by this means obtain sufficient knowledge of the play to represent it. If an actor becomes himself the author of a play, his performance of it in public, or that of a theatrical company, with his consent, for a compensation, can not be regarded as any evidence of his abandonment of the manuscript to the public or to the profession of actors. Such a special use of an unpublished work for the author's benefit is perfectly consistent with the continuance of an ownership in it.

Rights of this kind appertain to aliens as well as citizens, having nothing to do with the statutes of copyright, and are accordingly of great consequence to foreign and non-resident authors, who, being unable to acquire a statutory copyright in their works, may still, by virtue of their ownership of an unpublished play, maintain an exclusive right to represent it upon the stage. Similar suggestions may be made as to lectures, whether written or oral. The act of delivering them before an audience confers no right upon the hearers to put copies of them on sale without the author's consent. Property in lectures is protected in Great Britain by a special statute (5 and 6 Will. IV., c. 65). The author in the U. S. must rely upon general principles of law, and may resort to an injunction or action for damages. So the exhibition of a statue or a picture gives no license to a spectator to multiply copies and place them upon sale. These rules do not admit of evasion by the unauthorized production of abridgments of manuscripts or copies of works of art reduced in size.

Notwithstanding what has been said it is clear that an author of a manuscript, etc., may absolutely lose all proprietary right in it by unequivocal acts of dedication to the public; as e. g. by placing printed copies of it on sale without obtaining copyright, or by obtaining a copyright in a foreign country and selling the work there.

Literary property may, in the stage of ownership now under consideration, be assigned, so that a distinction will spring up between an author and a mere proprietor. The sale of a manuscript will in general give the purchaser all the rights which the author of it, considered as an owner of an unpublished work, would possess. Whether he could take out a copyright or not could not be determined as a mere matter of reasoning, but would depend on the special provisions of the copyright statutes.

A question of some difficulty has arisen as to the point whether any legal protection can be given to a literary unpublished work which is unsound on the score of morality or contains doctrines subversive of public policy. This question must not be confounded with one which may arise under copyright statutes, as the considerations in the two cases are quite different. In the latter case there is sometimes a distinct provision that the copyright shall not protect an immoral or libelous publication. As to the case of a manuscript, it would appear that the following distinction should be made: no protection should be given to the author by the courts which would enable him to make his immoral work the source of gain or profit. On the other hand, if he simply desires to retain his right of property—e. g. to prevent others from publishing it altogether, as well as to refrain himself—every consideration of justice and expediency requires that he should be permitted to do so. Suppose that a person while in the immaturity of his powers composes a work extravagant or immoral in its views of the rights of society or of individuals, but that in later life his opinions are changed, and he comes to view with abhorrence doctrines

that he once warmly approved, and he finds that some person against his consent has obtained possession of his manuscript and is about to publish it, shall he be prevented by law from suppressing such a publication? Great jurists have answered this question in the affirmative, on the theory that there *can be no property* whatever in such a manuscript. Their reasoning is unsatisfactory and inconclusive, and the true view would seem to be that the author is still the owner of the work, considered merely as an item of property, but can not invoke the aid of the courts to enable him to make profit from that which is inherently vile and base.

In the U. S. the remedies for the violation of the proprietary rights of an author, being given by the common law, may be sought in the State courts, notwithstanding a U. S. statute allows an action against a person who publishes a manuscript without the consent of the author or proprietor, such author, etc., being a citizen of the U. S. or a resident therein. It will be observed that the terms of this statute are not so comprehensive as the rule of the common law, as it confines the remedy to a "citizen or resident," and it appears to have been enacted for the benefit of those persons only who are entitled to the statutory copyright. Remedies, so far as this act extends, are cumulative, and may be sought either in the U. S. or State courts.

International Copyright.—This is an arrangement by which an author residing in one country may secure in such other countries as are parties to the arrangement the exclusive right of multiplying copies of his intellectual productions, and selling the same. In Great Britain international copyright was first granted by the 1 and 2 Vict., c. 59. This act permitted the Queen, in council, to grant to the authors of original foreign works such term of copyright in the British dominions as she pleased, provided the same did not exceed the term allowed for similar works in the United Kingdom. Further legislation on the subject was had in the 7 and 8 Vict., c. 12, and again in 15 Vict., c. 12. By the latter act the Queen, in council, may grant a copyright of five years for an authorized translation of foreign works, and also may prohibit for a similar period, the representation of an unauthorized translation of a foreign dramatic piece. Prussia, however, first set the example of granting international copyright by a law, passed in 1837, which provided that every country might secure copyright for its authors in Prussia by granting reciprocity. In 1852 France passed a law forbidding the piracy of books and works of art published abroad, without requiring reciprocity. Prior to 1891 an author was not entitled to a copyright in the U. S. unless he was a citizen or a resident of the same. And in order to be a resident within the meaning of the law, the foreign author must have formed an intention, at the time of recording the title of his work in the foreign office, of making the U. S. his permanent home. But in 1891 the Government of the U. S. abandoned the policy which it had hitherto pursued, and enacted a law which conferred on foreigners the privilege of copyright. The law, however, only applies to a citizen of a foreign state or nation when such foreign state or nation permits to citizens of the U. S. the benefit of copyright on substantially the same basis as its own citizens; or when such foreign state or nation permits to citizens of the U. S. copyright privileges substantially similar to those provided for in U. S. law; or when such foreign state or nation is a party to an international agreement which provides for reciprocity in the grant of copyright, by the terms of which agreement the U. S. may at its pleasure become a party to such agreement.

Revised by HENRY WADE ROGERS.

Coqua'go: the main branch of the Delaware river; rises in the Catskill Mountains in New York. It flows first southwestward, and then southeastward, until it unites with the Popacton at Hancock, on the line between New York and Pennsylvania. Length, nearly 100 miles.

Coquelin, kok'lăñ', BENOIT CONSTANT: b. at Boulogne, France, Jan. 23, 1841; entered the Conservatory in Paris 1859; studied under Regnier, and made his *début* in the Théâtre Français Dec. 7, 1860; in 1863 he became a *sociétaire*. Scagnavel, Scapin, Don Juan, and Figaro in the classical comedy, and in the modern drama Pierre Gringoire, Marcel in *Les Ouvriers*, the Duke in *L'Étrangère*, and Leopold in *Les Fourchambault* are among his most brilliant creations. During the siege of Paris in 1870 Coquelin continued to play, that the public courage might be kept up. In the summer of 1879 the whole company of the Théâtre Français was given permission to go to London. Coquelin was well received in the British metropolis. In 1888 Coquelin visited the U. S., appearing with Jane Hading, and again in 1900, with Mme. Bernhardt. A second engagement in London in 1892 was unsuccessful.—His brother, ERNEST ALEXANDRE HONORÉ COQUELIN, generally known as Coquelin cadet, is also a celebrated actor, and a *sociétaire* of the Théâtre Français since 1876. B. B. VALLENTINE.

Coquerel, kok'rel', ATHANASE LAURENT CHARLES: a Protestant minister; b. in Paris, Aug. 27, 1795. He was pastor of the French church at Amsterdam from 1818 to 1830, when he removed to Paris, where he gained distinction as a pulpit orator. In 1848 he was a moderate republican member of the Constituent Assembly. Among his works is *Modern Orthodoxy* (1842) and many volumes of sermons. He was liberal in theology. D. Jan. 20, 1868.—His son, ATHANASE JOSUÉ LAURENT, became an eminent Protestant pulpit orator, and the leader of the liberal party that seceded when a schism occurred in the Protestant synod in June, 1872. D. July 25, 1875.

Coquil'la-nuts [Span., dimin. of *coco*, cocoa-tree, cocoa-nut]: the seeds of *Attalea funifera*, a South American palm. The shells of the seeds or nuts are hard, have a close texture, and are susceptible of a fine polish. This shell is much used in turnery for the heads or handles of umbrellas, for toys, and ornamental articles.

Coquimbo, kō-keem'bō: a province of Chili; bounded N. by Atacama and S. by Aconcagua, and extending from the Pacific to the summits of the Andes; area, 12,905 sq. miles. Capital, La Serena. The surface is much broken, but the valleys are very fertile; the mines, especially of copper, are among the richest in Chili. Pop. (1895) 160,898.

H. H. S.

Coquimbo: the principal seaport-town of Coquimbo province (see map of South America, ref. 11–C). The harbor is good and the town is well built. Two railroads connect it with the agricultural and mining regions of the province, and the import and export trades are important. Pop. (1891) about 10,000. Coquimbo is now essentially united to La Serena, the capital of the province, just N. of it at the mouth of the Coquimbo river. Serena was founded by Valdivia in 1544, and named, it is said, after his native village in Spain. Pop. about 20,000. H. H. S.

Coquimbo Owl: See BURROWING OWL.

Coquina: See LIMESTONE.

Co'ra: an ancient city of Italy, in Latium, about 36 miles S. E. of Rome (see map of Italy, ref. 6–E). Livy mentions it as being a *colonia Latina* in 503 B. C. Few cities of Latium have more considerable remains of antiquity than Cora. Here are relics of ancient walls built of massive polygonal blocks. The site is now occupied by the town of *Cori*.

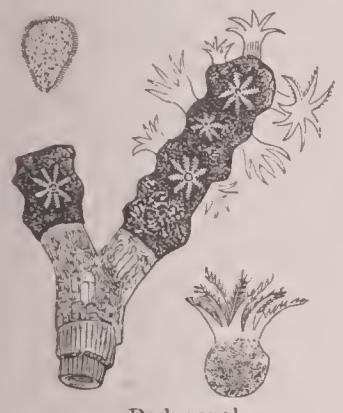
Cor'acoid Bone [*coracoid* is from Gr. κορακοειδής, raven-like; κόραξ, raven + εἶδος, appearance]: a bone of the shoulder-girdle, existing in man and the higher vertebrates as the *coracoid process*, a projection from the lower anterior border of the scapula. In the Monotremes, echidna, and ornithorhynchus, the coracoid connects the scapula with the sternum, and forms a part of the glenoid fossa. In birds the coracoid is always present, and is the most important bone of the shoulder-girdle, articulating with the front of the sternum and forming the main support of the wing. It is large in turtles, forms a part of the glenoid fossa, runs from carapace to plastron (the lower part probably being precoracoid), forming the truss by which the weight of the body is supported on the fore limbs. In other reptiles when fore limbs are present the coracoid forms part of the glenoid fossa, and intervenes between scapula and sternum. It is present in various degrees of development in *Batrachia*, but, as a rule, is well developed in the *Anoura*, while in the tailed batrachians it is cartilaginous, and forms the greater part of the shoulder-girdle. Anatomists differ as to the homologue of the coracoid in fishes. According to Cope, it is the lower of the two bones situated at the base of the pectoral fin, the upper being the scapula; these are named by Gill respectively hypocoracoid and hypercoracoid. In transcendental anatomy it has been considered as the hæmapophysis of the fourth (occipital) cephalic vertebra.

F. A. LUCAS.

Coracoid Process: See CORACOID BONE.

Cora Indians: See PIMAN INDIANS.

Coral [from Gr. κοράλλιον, coral]: the hard skeleton secreted* by certain CŒLENTERATA (*q. v.*) of both the Hydrozoan and Scyphozoan divisions. It is composed of calcic carbonate plus a varying amount of animal matter, and is a secretion of the external layer (ectoderm) or skin of the body. A few species of coral polyps, like the mushroom coral (*Fungia*) live separate, and in such the coral corresponds to the individual; but in most cases the coral-producing animals are colonial, and in such instances the mass of coral is the product of the whole colony, the positions of its various members being more or less clearly seen in the pits on the surface of the coral. Most of the coral-producing animals belong to the Actinozoan division of the *Scyphozoa*, the only exceptions being the Hydrozoan stagshorn coral (*Millepora alcicornis*) and its allies, in which the pits occupied by the polyps are divided by horizontal partitions (whence the group, together with other non-related forms, was formerly called *Tabulatæ*). Of the coral-producing Actinozoa (see POLYP) there are two divisions, the *Octocoralla*, where the parts of the animal are eight-radiate, and the *Hexacoralla*, where they are in multiples of six. To the former belong the sea-fans and sea-whips (*Gorgonia* and *Muricea*) of the southern coast of the U. S., and the precious coral of the Mediterranean. The valuable red coral (*Corallium rubrum*) has a tree-like form, and sometimes reaches a foot in length. The most important coral-fisheries are on the coasts of Algiers, Tunis, and Morocco, but coral is also obtained near Naples, Leghorn, Sardinia, and Corsica, and Naples is the center of the coral-trade. The annual collection of a fishing-boat varies from 400 to 900 lb. In 1873 the Algerian fisheries produced about $500,000 worth of the rare coral. The price varies according to color, large pieces of the finest rose pink being valued at from $400 to $500 per oz., but small bits of the poorer colors, such as are used for children's necklaces, are worth $1 to $1.50 per oz. Of the *Hexacoralla*, *Antipathes* of the tropics produces the valuable black coral. The brain corals (*Diploria*, *Manicina*), star-corals (*Astræa*), etc., are massive. The Madrepores, Oculinas, etc., are branching, while *Agaricia*, etc., form incrusting masses. None of these have any commercial or economic value, except as a source of lime; they are, however, very important in nature's economy, in that they all aid in the building up of coral reefs and islands. No true reef-building corals can live where the water falls below 60° F., but some of the Alcyonoid forms occur even in the Arctic seas.



Red coral.

J. S. KINGSLEY.

Coral Islands and Coral Reefs are among the most characteristic features of the tropical seas. They occur in several different relations; fringing reefs, barrier reefs, and atolls. Fringing reefs lie close along the shore of some island or land mass, not of coral formation. Barrier reefs are separated from the adjacent island or mainland by a lagoon of relatively shallow water, varying from a mile or two to many miles in width (Fig. 1). The Society islands of the mid-Pacific are generally surrounded by more or less continuous barrier reefs, with lagoons a mile or more wide. The great Australian barrier reef, 1,200 miles long, and lying 50 to 300 miles off the N. E. coast of Australia, with which it is roughly parallel, is the largest reef of this kind. Atolls are roughly oval reefs, inclosing a shallow lagoon, seldom over 200 or 300 feet deep, and unbroken by any central island.

FIG. 1.—Bolabola, with barrier, reef, lagoon, and coral islands.

* It is hardly necessary to say that the coral-making animals are not "insects" and that coral is not the "house" which they "build."

These are seen to the number of eighty in the Paumotu or Low Archipelago; to a somewhat greater number in the Caroline-Marshall Archipelago and elsewhere in the Pacific. The term *atoll* is adopted as a general name for such islands from its local use in the Maldive Archipelago, S. W. of India.

Conditions of Coral Growth.—Coral reefs are formed by the growth of various species of corals, or small polyps, living in communities. Each individual may be compared in form to a minute sea-anemone; it secretes carbonate of lime from solution in sea water, and thus forms a stony skeleton, growing slowly to a considerable mass. The destructive action of the waves, as well as of various boring mollusks, breaks up this limestone framework; the finer particles are washed out into deep water, and the coarser sand is thrown back on the older part of the reef. The surface of coral reefs and atolls is built a few feet above the level of the sea by the heaping of coral sand from the beach by waves and winds. The breadth of the strip of land thus formed may reach half a mile or more. The reef is more or less interrupted by transverse channels, connecting the lagoon with the ocean, held open by tidal or wind currents, and frequently giving entrance to protected harbors. Hence an atoll may consist of many small linear islands, slightly disconnected. Reef-building corals thrive only in water whose lowest monthly temperature does not fall below 68° F.; hence they are excluded from the eastern equatorial Pacific, where the cool Peruvian current flows north from far southern latitudes; even directly under the equator the water about the Galapagos islands is too cold for reef-building. The central and western equatorial Pacific, together with the torrid Indian Ocean, where the surface water is warmer from a longer residence in the torrid zone, are the regions of most numerous coral reefs and islands. They are relatively uncommon in the Atlantic; although the Bermudas, Bahamas, and Florida Keys are coral built; and many reefs occur around Cuba and other West Indian islands. Reef-building corals are also limited by depth, none growing more than 120 feet from the surface; although the sand and mud from the wasting of the reef are spread to much greater depths.

Theories of Reef Formation.—The origin of the various forms of coral reefs, particularly of atolls, which occur amid great depths of the open ocean has naturally given rise to many theories. Those now current may be outlined as follows: In 1835 Darwin, while on the British exploring vessel Beagle, conceived that the various forms of coral reefs might be explained as the result of slow submergence of a fringing reef. Recognizing that a shallow foundation is necessary for the beginning of a reef, Darwin believed that the fringing reef is the primitive form of all reefs, thus implying the presence of some pre-existent land, such as a volcanic island, on whose shoal waters the young floating forms of the coral polyp colonized from some other source. A fringing reef thus formed is shown in Fig. 2.

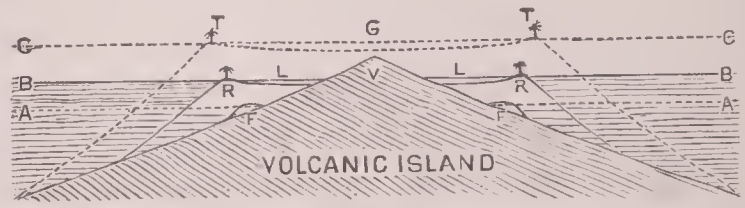


FIG. 2.—Diagram illustrating Darwin's theory of atolls, by submergence, with upward growth of reefs: A A, inferred level of the sea when the present barrier reef was first formed as a fringing reef; F F, on the shore of a new volcanic island; B B, existing level of the sea after inferred slow submergence of the island, with upward and outward growth of corals transforming the fringing reef into a barrier reef, B B, with shallow lagoon, L L, inclosed; C C, future level of the sea, the original volcanic cone, V, being entirely submerged, and the barrier reef having grown upward, forming an *atoll*, T T, with uninterrupted lagoon, G.

F F, the close to sea-level, A A. As the volcanic island is gradually submerged, the reef grows upward on its outer side, where it is well fed by the waves; it also grows slowly outward, leaving a widening lagoon, L L, between its rim, R R, and the diminishing island, V, when the sea-level rises to B B. The lagoon is kept shallow by the washing in of fine coral mud from the face of the reef. Finally, the volcanic summit may be entirely submerged, and when the sea-level stands at C C there is only a roughly circular reef, T T, inclosing a broad lagoon, G. This stage illustrates the perfected atoll. It is manifest that as the original base of the reef sinks, the thickness of the upgrowing reef greatly in-

creases. The size of the final atoll will depend not only on the measure of the initial fringing reef, but also on the rate of submergence; a rapid submergence presumably causing a diminution of the diameter of the reef, a slow submergence allowing an increase of diameter. Darwin's theory was independently invented by Dana, naturalist of the U. S. exploring expedition under Wilkes in 1838–42. It gained a wide acceptance.

Semper in 1863 first cast serious doubt on the assumed necessity of submergence; and since then Semper's theory has been vigorously advocated by Murray, of the British Challenger expedition. Assuming that the level of the sea remains constant, these observers maintain that the foundation on which the initial reef is formed may be either a dwindling volcano, wasting under the attack of weather and waves, or a submarine bank, rising by accumulation of marine deposits. The coral reef once begun, it extends outward, always growing most rapidly in the ocean surf. Its waste is washed down the steep outer slopes, and forms a platform on which further outward growth may extend; and at the same time the solvent action of sea water on the decaying coral sand consumes the inner margin where the coral growth is slower; thus the lagoon is kept open behind the advancing reef front, as illustrated in Fig. 3. Barrier

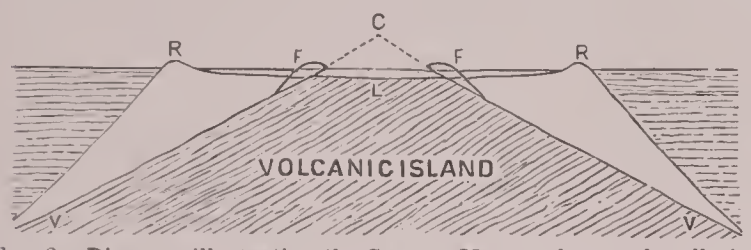


Fig. 3.—Diagram illustrating the Semper-Murray theory of atolls, by outward growth of reef with constant level of the sea: V C V, original outline of volcanic island reduced by rain and waves to V L V, a submarine platform; F F, original site of reefs on margin of volcanic platform, V; R R, later form of reefs, due to outward growth on ocean side and selection on inner or lagoon side.

reefs might thus be formed even during an uplift of the sea bottom, if the coral growth were active and the uplift relatively slow.

It is manifest that these two theories are not contradictory. Indeed, Darwin clearly recognized the power of fringing reefs to grow outward on the banks of their own formation, thus converting themselves into barrier reefs; but he did not emphasize this process as has since been done, because it would not easily account for atolls. The Semper-Murray theory of outward growth is a valuable extension of the Darwin-Dana theory of upward growth; but the new theory does not supplant the older one. It is now recognized that wide barrier reefs may be formed without submergence, and that the supposed demonstration of submergence given by such reefs is weakened; but many facts prove that submergence can not be neglected. The chief of these are the known occurrence of changes of sea-level on many Coasts (*q. v.*); the general association of signs of elevation of the land with fringing reefs and elevated reefs; the irregular outline of the central islands within barrier reefs, like those in the Fiji group, as if partly submerged; the great number of island groups in which atolls alone occur—it would be difficult indeed to account for these without submergence; the comparatively regular distribution of the various forms of reefs in great belts, as if broadly influenced by some widely acting control, such as a general depression of the ocean floor; the occurrence of drowned atolls, as in the Chagos banks, Indian Ocean, as if submergence had here advanced at a faster rate than the upward growth of the corals.

Completed coral islands or atolls afford very imperfect support for man. The form of the islands is low and monotonous; the arable portion is but a small part of the whole, and even this may be overwhelmed by storm or earthquake waves; the variety of plant and animal life is very small, the cocoanut palm being almost the only useful plant. There is only one kind of rock and no metal. The lower forms of marine life flourish in great variety and beauty on the outer reef and in the quiet waters of the lagoon, but the native human population of such islands is degraded. Famine is not infrequent, engendering infanticide, war, and cannibalism. W. M. Davis.

Cor'allines [so called from their resemblance to the corals, to which they were formerly referred]: certain plants classed with the red algæ (*Ftorideæ*) and referred to the family *Corallinaceæ*. They constitute the genus *Corallina*, and several other genera. These plants are peculiar in being of a rigid, stony character, and from the presence (in most species) of a large proportion of carbonate of lime. They are not abundant on the Atlantic coast of the U. S., but are of much more frequent occurrence in the Pacific. From their highly differentiated organs of fructification "the species of *Corallinaceæ* are now placed at the head of the *Florideæ*." They occur abundantly as fossils. The *Corallina officinalis* is common on the northern shores of Europe, and also occurs on the Atlantic coast of British America and the U. S. The name coralline is often given to various marine polyps, but should be restricted to coral-like plants.

Coral Reefs: See Coral Islands and Coral Reefs.

Coral Snakes: various serpents marked with conspicuous red bands which suggest polished red coral. Some of these snakes, like *Elaps fulvius* of the U. S. and *E. corallina*, are venomous, while others, which resemble them very closely, are harmless. Among these latter are various species of *Ophibolus, Oxyrhopus*, and *Erythrolampris*.

F. A. Lucas.

Coranach: See Coronach.

Corato, kō-raa'tō: a town of Italy, province of Bari: 24 miles W. of Bari (*q. v.*). Near here in 1503 a combat took place between thirteen Italian and thirteen French knights, led by Colonna and Bayard, respectively. Pop. 33,258.

Coray, or **Koray**, Diamant; Greek philologist and patriot; b. at Smyrna, Apr. 7, 1748. He studied medicine at Montpellier, in France, and became a resident of Paris in 1788. To promote the regeneration of Greece and the revival of the Greek nationality, he published editions of ancient Greek authors and wrote several political tracts. D. Apr. 6, 1833.

Cor'bel [viâ Fr. from Lat. *corbis*, basket]: in architecture, a projecting bracket, often sculptured like a modillion, sometimes in the form of a basket, for the purpose of supporting a superincumbent object or for receiving the springing of an arch. A corbel-table is a projecting battlement, parapet, or cornice resting on a series of corbels.

Corbet, Richard: English bishop and poet; b. at Ewell, Surrey, 1582. He was educated at Oxford, and was successively dean of Christ Church College (1620); Bishop of Oxford (1624); and Bishop of Norwich (1632). His poems, which are sprightly and humorous, include a *Journey into France* (1613) and *Poetica Stromata* (1648). His best-known verses are his *Farewell to the Fairies*. D. in Norwich, July 28, 1635. See the memoir by Octavius Gilchrist prefixed to his edition of Corbet's poems (London, 1807; reprinted, 1810).

Corbett, Julian Stafford: See the Appendix.

Corbould, Edward Henry: historical painter; b. in London, Dec. 5, 1815. Won two gold medals of the Society of Arts; member of the Institute of Painters in Water-colors; teacher of drawing and painting to the children of Queen Victoria 1851–72. Among his works are *Fall of Phaëthon* (1834); *St. George and the Dragon* (1835); *Marriage of Nigel Bruce and Agnes of Buchan* (1870); *Queen Victoria* (1871); *Canterbury Pilgrims* (1874); *Iris* (1878).

Cor'bulo, Cnæus Domitius: Roman general who flourished under Claudius and Nero. He commanded the Roman army in a war against the Parthians, whom he defeated. Nero, who was jealous of him, ordered him to be put to death; when Corbulo heard this he fell on his sword, 66 A. D. A memoir by him of his experiences in Asia is mentioned by the elder Pliny, but is not extant.

Cor'coran, Michael: brigadier-general of U. S. volunteers; b. in Carrowkeel, Ireland, Sept. 21, 1827; d. Dec. 22, 1863. He emigrated to the U. S. in 1849, and settled in New York city. At the commencement of the civil war he departed for Washington with his regiment, the Sixty-ninth New York, and participated in the first battle of Bull Run, where he was taken prisoner and confined at Richmond, Va., and Charleston, S. C., nearly a year. On being exchanged he organized the Corcoran Legion, and was made a brigadier-general of volunteers, to date from the day of his capture, July 21, 1861. He was thrown from his horse near Fairfax Court-house, Va., Dec. 22, 1863, and fatally injured.

Corcoran, William Wilson, LL. D.: banker; b. at Georgetown, D. C., Dec. 27, 1798; studied at Georgetown College; began banking at Washington in 1837; amassed great wealth; was famous for his magnificent charities and

splendid gifts to the public. In 1847 he presented the Oak Hill Cemetery to Georgetown, and in 1857 the Temple of Art—generally called the Corcoran Gallery—to the city of Washington, where he also founded, in 1870, the Louise Home for Indigent Women. D. Feb. 24, 1888.

Corcy'ra (in Gr. Κόρκυρα): the ancient name of an island in the Ionian Sea, now Corfù (*q. v.*). It was colonized by the Corinthians in 734 B. C., and soon became one of the chief maritime powers of Greece.

Corday d'Armans, kōr'dā'daăr'maăn', Marie Anne Charlotte: revolutionist; b. at St.-Saturnin, Normandy, July 28, 1768; placed by her father, a poor Norman nobleman of literary tastes, in a convent at Caen; removed after the convent was closed by the Revolution to the house of her aunt, where she led a lonely life and read the works of Voltaire and Plutarch. Her lover, a young cavalry officer of republican tendencies, was assassinated by a mob. After the fall of the Girondists, May 31, 1793, many of them fled to Caen, and with them Charlotte became acquainted. She had obtained a passport, apparently with the thought of going to Paris, in April. On July 9 she suddenly left her aunt's on pretext of going to England; on the 11th she was in Paris; on the 13th, after several attempts, she finally obtained an audience with Marat, on the pretext of revealing the Girondists' plots. He was in his bath, and, according to Charlotte's confession, she told him what was passing at Caen; he took down the names of the men mentioned, and said that they should be guillotined in a few days; but as he spoke she drew from her bosom a knife and plunged it into his side. He cried out for help, but sank back dead. She was tried on the morning of July 17, sentenced to death, and guillotined the same day. She preserved her calmness and courage to the last, and her remarkable beauty and lofty bearing stirred even the hearts of her executioners. At her own desire her portrait, now in the Museum of Versailles, was painted by Hauer while she was in prison. So little is really known of her life that an estimate of her character is difficult. She was doubtless strongly impressed by classic ideals of heroism. Lamartine says: "In beholding her act of assassination history dares not applaud, nor yet, while contemplating her sublime self-devotion, can it stigmatize or condemn." He further calls her the "angel of assassination." Adam Lux, a deputy from Mentz, who witnessed her execution, was himself guillotined for proposing a statue to her memory. See Huard's *Mémoires sur Charlotte Corday* (1866); *Œuvres politiques de Charlotte Corday* (1863); Lamartine, *Histoire des Girondins*. C. H. Thurber.

Cordeliers [deriv. of O. Fr. *cordel* (> Mod. Fr. *cordeau*), cord; dimin. of *corde*: Ital. *corda* < Lat. *chorda* = Gr. χορδή]: a political club formed in Paris in 1790, which received its name from the fact of its meeting in the chapel of the convent of the Franciscan friars of that name. The organization was composed of the most extreme republicans and agitators, led by Danton, Marat, Hébert, and Camille Desmoulins, the latter of whom edited the famous revolutionary paper, *Le vieux Cordelier*. The club was first allied with, but afterward in violent opposition to, the Jacobins. It was overthrown in Mar., 1794, by Robespierre, and formally ended by the law of the 6th Fructidor (Aug. 23, 1795), which closed all the political clubs of France. C. H. T.

Cordeliers, or **Cord-wearers** [from O. Fr. *cordel*, a cord or rope; so called from their girdles of knotted cord]: a branch of the order of Franciscans. Soon after the death of St. Francis (1226) a long controversy as to the rules of the order arose, which ended in the division of the order into two great branches, Conventuals and Observantines. Of the Observantines there are three branches: the *Reformed*, established in 1419, the *Recollects*, established in 1500, the *Alcantarines*, established in 1555. In France the *Alcantarines* were called *Cordeliers* on account of their girdle. J. J. Keane.

Corder, Frederick: musician; b. in London, Jan. 26, 1852; at first intended for business, but, being strongly devoted to music, entered the Royal Academy of Music in 1874, and, being elected to the Mendelssohn scholarship, was sent to Cologne, where he studied four years under Ferdinand Hiller. Returning to England, he was appointed conductor at the Brighton Aquarium, and has since devoted his life to teaching and composition. His principal works are *In the Black Forest*, an orchestral suite, 1876; *Evening on the Seashore*, orchestral idyl, 1876; *Morte d'Arthur*, opera, 1877; *Philomel*, operetta, 1880; *The Storm in a Teacup*, operetta, 1880; *The Cyclops*, cantata, 1881; *Ossian*, overture for the Philharmonic Society, 1882; *Dreamland*, ode for chorus and orchestra, 1883; two operettas 1883 and 1885; *Prospero*, concert overture, 1885; *Scenes from the Tempest*, 1886; *The Bridal of Triermain*, cantata for the Wolverhampton festival, 1886; *Nordisa*, opera for the Carl Rosa Company, Jan. 26, 1887; *The Minstrel's Curse*, ballad with orchestral accompaniment, 1888, besides many smaller works. D. E. Hervey.

Cordille'ra (Span. pron. kōr-dĕel-yā'răă), or **Cordilleras** [Spanish, a chain of mountains]: the mountainous tract in Western North America. This name, originally used in a somewhat similar sense by Alexander von Humboldt, has been applied by J. D. Whitney and various other writers on physical geography to the mountains of Central America and Mexico, and to all those of the U. S. and British America lying W. of the Great Plains, but has not passed into popular use. See Mountain and Rocky Mountains.

Cordillera: in South America; one of the great longitudinal or north and south mountain chains of the Andean system. Where there is only one chain the word Andes is commonly used, but where there are two or three parallel ones one of them only is known, in common language, as the Andes, and the others are called Cordilleras. Local custom varies in the use of the two terms, and this has given rise to much confusion. In Colombia the three principal ranges are called respectively the Western, Central, and Eastern Cordilleras. In Ecuador and Northern Peru the easternmost range, abutting on the Amazonian lowlands, is called the Andes *par excellence*, and the parallel western chains are Cordilleras, with various local names. Farther S., on the contrary, the Andes are the western chain, separating Bolivia and the Argentine from Chili; the mountains farther E., some of them still higher, form the Cordillera Real, Cordillera Oriental, and so on. The term Cordillera is also used at times, loosely, for the cross chains or knots so frequent in the Andean system. Herbert H. Smith.

Cór'doba: a province of Argentina; bounded N. by Catamarca and Santiago del Estero, E. by Santa Fé, S. by the territory of Pampa, and W. by San Luis and Rioja. Area, 54,000 sq. miles. The western part is traversed by the Sierra de Córdoba; the eastern part belongs to the great pampean plain through which the rivers Tercero, Cuarto, and others flow to the Paraná. There are numerous small lakes and swamps. The province is celebrated for its rich pastures, and corn, wheat, and lucerne are cultivated. Pop. (1895) 353,000. Capital, Córdoba. H. H. Smith.

Córdoba: capital and principal city of the Argentine province of the same name; on the Rio Primero, at the crossing of the Central Argentine R. R.; 387 miles from Buenos Ayres (see map of South America, ref. 8–D). It was founded in 1573, and is celebrated for its old cathedral, churches, monasteries, etc., and for its university, which is the second in age in America. The national observatory and meteorological station are located here. The Alameda, or public promenade, is one of the finest in South America. Córdoba has an important trade in hides and wool. Pop. (1895) including the suburbs, 54,400. Herbert H. Smith.

Cordova: a province of Spain; bounded N. by Badajos and Ciudad Real, E. by Jaen, S. by Malaga, and S. W. and W. by Seville. It is intersected by the Guadalquivir. The surface in some parts is mountainous. Area, 5,189 sq. miles. Capital, Cordova. Pop. (1887) 420,714.

Cordova, kōr'dō-*v*a [Span. *Cordoba*, or *Cordova*; anc. *Colonia Patricia*]: a city of Spain; capital of province of same name; situated in a plain on the river Guadalquivir; 71 miles N. E. of Seville, with which it is connected by a railway (see map of Spain, ref. 18–E). The river is here crossed by a noble stone bridge of sixteen arches built by the Moors in the eighth century, and defended by a Saracenic castle. The cathedral, originally a beautiful Mohammedan mosque, founded in 786 A. D., presents in the interior a forest of columns of many orders and materials, brought from various ancient temples. Cordova contains a bishop's palace, three colleges, a city-hall, and numerous hospitals. It was formerly noted for the preparation of goat leather, called *cordovan*. Here are manufactures of silk fabrics, paper, silverware, hats, etc. The ancient *Corduba*, sometimes called *Patricia*, built 152 B. C. by the Romans, was second only to Gades among the cities of Hispania, and the birthplace of the two Senecas, of the poet Lucan, and of the Arabic physician Averroës. This place, was captured

by the Moors in 672 A. D., after which it was for several centuries the splendid capital of the Western caliphs. In the tenth century it contained nearly a million inhabitants and 300 mosques. In 1236 it was taken and almost destroyed by Ferdinand III. of Castile. Pop. (1887) 55,614.

Cordova, Diego Fernandez, de: See Fernandez de Cordova.

Córdova, José Maria: South American general; b. at Rio Negro, in the province of Antioquia, New Granada, 1800. He joined the revolutionary army when a boy; served under Bolivar in Venezuela and New Granada, and became general for his services under Sucre in the Quito campaign (1822). At the battle of Ayacucho, in Peru, he led the decisive charge (Dec. 9, 1824). Returning to Colombia he remained devoted to Bolivar until 1829, when he revolted, believing that a monarchy was contemplated. Gen. O'Leary, sent against him, defeated his small force at Remolino, Córdova being killed in the battle (Oct. 17, 1829).

Herbert H. Smith.

Cordova, Francisco Hernandez, de: Spanish soldier; b. about 1475. He went to the Isthmus of Panama with Pedrarias in 1514, and served in various raids. In 1524 he was sent to settle Nicaragua, which had just been explored by Gil Gonzales Davila (1522–23), but which Pedrarias claimed as a part of his territory. Cordova sailed from Panama, landed on the Pacific side of Nicaragua, founded Granada, Leon, and other towns, and explored the lake, discovering its outlet. On hearing of the arrival of Gil Gonzalez in Honduras, he sent his lieutenant, Hernando de Soto, against him; Soto was defeated and captured; Gil Gonzalez himself was captured by Olid, who had been sent there by Hernando Cortés. Olid rebelled and was killed, and finally Cortés himself went to Honduras to settle affairs. Cordova, who had remained in Nicaragua, sent a message to Cortés (1525), offering to transfer his allegiance to him, thus abandoning Pedrarias. Cortés encouraged him, but soon after was obliged to return to Mexico, and Cordova then resolved to create an independent government in Nicaragua for himself. He was resisted by Soto and a few others; they carried word of the defection to Pedrarias, who hurried to Nicaragua with a considerable force, seized his lieutenant at Leon, and had him beheaded (Mar., 1526). Herbert H. Smith.

Cordova, or **Cordoba**, Francisco Hernandez: a Spanish soldier, of whose early life nothing is known. In 1511 he accompanied Velasquez in the conquest of Cuba, received a grant of land and Indians near Santi Espiritu, and in 1517 had become one of the wealthiest men in the island. In that year he was induced by some adventurers from Panama to join as captain in a voyage of exploration westward in the hope of obtaining gold and Indian slaves. Probably Cordova bore the greater part of the expenses of the expedition, which was purely a speculation. Leaving Cuba with three vessels and 110 men, Feb. 12, 1517, they discovered the east coast of Yucatan a few days later, and followed it around to Campeche and beyond. At Champotan they had a fight with the Indians, in which Cordova was severely wounded. They obtained little gold and only two slaves, but found signs of a civilization higher than any that had yet been seen among the natives of America. From near Campeche Cordova passed over to Florida, and thence to Cuba, where he died of his wounds soon after (May or June, 1517).

Herbert H. Smith.

Cordova, Jorge: Bolivian revolutionist; b. in La Paz, 1822. He was an uneducated soldier, but acquired some social standing by his marriage with a daughter of President Belzu. When Belzu was driven out by the revolution of 1855, Gen. Cordova was proclaimed in his place. As a ruler he showed little energy, either for good or evil, but was at least humane in his treatment of political offenders. In 1858 he was deposed by another outbreak. He was shot in the "massacre of Loreto," at La Paz, Oct. 23, 1861.

H. H. S.

Cordova, Pedro, de: Spanish Dominican missionary; b. in 1483. He was vicar of twelve or fifteen Dominicans who went to Hispaniola in 1510, and one of the first of their order to reach the New World. Soon after arriving, Cordova and his companions began to preach against the enslavement of the Indians. Getting nothing but opposition from the colonists, they sent one of their number, Antonio Montesinos, to represent the evil to the king, and in 1512 Cordova himself went to Spain. He was influential in obtaining new laws in favor of the Indians, though these proved ineffectual, and he obtained permission to plant a missionary colony on the American continent. Returning to Hispaniola with a new force of monks, he sent three of them to form his colony on the coast of Venezuela, near Cumaná. This was the first European settlement in that part of America. The Indians received the missionaries well; but the cruelties of some Spanish slave-dealers soon provoked them against the whites, and, though the missionaries were guiltless, they were killed in 1515. Cordova then visited Venezuela himself, and left another mission colony there, which was broken up somewhat later. He was a friend of Las Casas, and did all he could to forward his humane schemes. D. at San Domingo, May, 1521.

Herbert H. Smith.

Cordova y Figueroa, Pedro, de: Chilian historian; b. at Concepcion, 1692. He became a soldier in 1725, served in Araucania, was promoted to *sarjento mayor*, founded Los Angeles in 1739, and was afterward *alcalde* of Concepcion, where he probably died about 1775. His *Historia de Chile* was written between 1740 and 1745, and includes the conquest and history of the country to 1717. It was the best and most complete work on the subject up to that date. The manuscript was long preserved in the National Library at Madrid. A copy was at length made for the Chilian Government, and it was published in the great *Colección de Historiadores de Chile*. Herbert H. Smith.

Corea: See Korea.

Coreal, Francisco: the name, probably fictitious, appended to a book of travels first published in France as *Voyage aux Indes Occidentales* (1727). The author claimed to have been born in Cartagena in 1648, and to have traveled from 1666 to 1679 through Florida, Mexico, and a great part of South America. The work is probably a compilation by some European author, and it is full of errors.

H. H. S.

Corean Language: See Korean Language.

Corel'li, Arcangelo: Italian musician and composer; b. near Imola, Feb., 1653; most of his life was passed in Rome. He produced, besides other works, *Concerti Grossi* (1712). D. Jan. 18, 1713.

Corentyn': river of Guiana, forming the boundary between the English and Dutch colonies. It rises near the Brazilian frontier, has a general northerly course, and reaches the Atlantic, with a length along the main curves of about 400 miles. The lower portion is very tortuous, and is generally lined with forests; it is navigable for about 150 miles for vessels drawing 7 feet. The middle Corentyn has a series of rapids and falls of great beauty.

Herbert H. Smith.

Coreop'sis [from Gr. κόρις, bug + ὄψις, appearance]: a genus of herbaceous plants of the family *Compositæ*, named with reference to the form of the fruit. Plants of this genus have neutral ray florets and a double involucre. Many species of this genus are natives of the U. S., and are popularly called tickseed. The *Coreopsis tinctoria* grows wild in the plains beyond the Mississippi, and is commonly cultivated in gardens for the beauty of its flowers, which are yellow with a brown-purple center.

Corfù, or **Korkyra**: one of the sixteen nomarchies into which the kingdom of Greece is divided. It embraces the island of Corfù, Paxo, Leucadia, and several smaller islands. Area, 431 sq. miles. Pop. (1889) 114,535; (1896) 124,578.

Corfù [an Italian corruption of Gr. Κορυφώ, the Byzantine name for the island, from the two "peaks" (κορυφαί) on which the citadel stands; modern Gr. Κορφοί; anc. Lat. *Corcyra*]: one of the Ionian islands; belonging since Mar. 29, 1864, to the kingdom of Greece. It is separated from Albania by a channel which varies in breadth from 2 to 12 miles. It is 38 miles long, and has an area of 227 sq. miles. The surface is hilly and picturesque, the highest points being about 3,000 feet above the sea. The soil is very fertile. Olive oil is the chief article of export. Pop. (1889) 84,492. Capital, Corfù. The people of ancient Corcyra waged war against Corinth. A naval battle which occurred between these powers in 665 B. C. is mentioned by Thucydides as the first sea-fight on record. Corcyra was in alliance with the Athenians in the Peloponnesian war.

Corfù: a fortified seaport-town; capital of the island of the same name; on the east coast; 10 miles S. W. of Butrinto; lat. 39° 37′ N., lon. 20° 6′ 2″ E. (see map of Greece, ref.

15–H). It has a safe and convenient harbor, and is defended by a citadel and two castles. It has a university, founded in 1823, a cathedral, and numerous Greek and Roman Catholic churches, and a lighthouse. An archbishop of the Greek Church resides here. Corfù stands near the site of the ancient town of *Corcyra*. Pop. (1896) 17,918.

Corin'na (in Gr. **Κόριννα**): celebrated Greek lyric poetess of Tanagra in Bœotia; flourished about 500 B. C. It is said that she overcame Pindar in a poetical contest, but the story is discredited. Scant fragments may be found in Bergk's *Poetæ Lyrici Græci* (3d ed., vol. iii., pp. 543–553).

Cor'inth (Lat. *Corinthus*; Gr. **Κόρινθος**): an ancient and celebrated city of Greece; on the Isthmus of Corinth and near the *Sinus Corinthiacus* (Gulf of Lepanto); about 50 miles W. by S. from Athens (see map of Greece, ref. 16–K). The isthmus is a sterile plain inclosed on several sides by mountains. It is subject to frequent earthquakes. Corinth commanded all the passes between the Peloponnesus and Northern Greece. It had a very favorable position for commerce, and seemed to be destined by nature to be a great maritime power. In consequence of its position it formed the most direct communication between the two principal Grecian seas—the Ionian and the Ægean—and became the emporium of the trade between the East and the West. It was one of the most populous cities of Greece. Its early history is obscure and mixed with fabulous legends. The family of the Bacchiadæ ruled here from 747 to 657 B. C. The Corinthians founded the colonies of Corcyra and Syracuse in 734 B. C. Periander, one of the Seven Wise Men of Greece, became tyrant (prince) of Corinth about 625 B. C., and reigned forty-four years. Soon after his death Corinth became an ally of Sparta, and was ruled by an oligarchy. The Corinthians were defeated by the Athenian general Myronides in 457 B. C. As the ally of Sparta, Corinth fought against Athens throughout the long Peloponnesian war (431–404 B. C.). In 395 B. C. Corinth united with other Greek states in a war against the Spartans, who defeated the allies in several battles. This war, called the Corinthian war, was ended by the peace of Antalcidas in 387 B. C., and Corinth then returned to the alliance with Sparta. Timophanes attempted to make himself tyrant of Corinth, but he was killed by his brother Timoleon in 344 B. C. The battle of Chæronea (338 B. C.) rendered Philip of Macedon master of Corinth, which was subject to his successors, until it was annexed to the Achæan League in 243. At this period Corinth was the richest and most luxurious city of Greece, and abounded in statues, paintings, and other works of art. The patron goddess of Corinth was Aphrodite (Venus), who had a splendid temple on the Acrocorinthus. The numerous fine temples which the wealth of the Corinthians enabled them to erect gave an impulse to architecture, and the most elaborate order of ancient architecture derived its name from Corinth, which was one of the principal seats of Grecian art, but produced no eminent poets or orators.

Having been captured by the Roman consul Mummius, in 146 B. C., Corinth was pillaged by his army, and nearly destroyed by fire. The most valuable works of art were carried to Rome. It remained in ruins for a century, and was rebuilt in the year 46 by Julius Cæsar, who planted there a colony of his veterans and freedmen. It soon rose again to be a populous and prosperous city, which was called *Colonia Julia Corinthus*. St. Paul preached here, and founded a Christian church, to which two of his epistles were addressed. Pausanias, who visited it between 150 and 200 A. D., says that it contained many things worthy of notice, some being the relics of the ancient city, but the greater part executed in the flourishing period after it was rebuilt by Cæsar. The principal monument of antiquity now remaining here is the citadel, built on a hill called Acrocorinthus, which rises 1,886 feet above the level of the sea, and is abrupt and isolated. The view from its summit is singularly magnificent, and comprehends a greater number of celebrated objects than any other in Greece. The Parthenon of Athens is distinctly seen at a distance of nearly 50 English miles. Among the few relics of the Greek city are seven Doric columns of a temple standing on the western outskirts of the modern town. These are 5 ft. 10 in. in diameter. The site of Corinth was occupied by the small town Gortho, destroyed by earthquake (Feb., 1858), and New Corinth was then built 5 miles from the ancient site, on the shore of the gulf, about 1½ miles W. of the entrance to the ship-canal, which has given it much importance. It is now a flourishing city. See SHIP-CANALS. Pop. 41,000.

Revised by C. C. ADAMS.

Corinth: city; capital of Alcorn co., Miss. (for location, see map of Mississippi, ref. 3–H); situated at the junction of the E. Tenn., Va. and Ga., and Mobile and Ohio R. Rs.; 93 miles E. by S. of Memphis, Tenn. It has large iron-works. Pop. (1880) 2,275; (1890) 2,111; (1900) 3,661.

After the battle of Shiloh, Apr. 6–7, 1862, the Confederate army retreated to Corinth. The national army being reorganized and strongly re-enforced, Halleck, who had arrived and taken command, slowly advanced on Corinth by regular approaches, arriving May 21 to within 3 miles of the place, expecting to meet with an obstinate resistance; but Beauregard, deeming it impossible for him to successfully resist, commenced (May 26) secretly evacuating, and by the 29th had removed or destroyed everything of value, retreating with his army southward to Tupelo. Halleck occupied Corinth May 30, and pursuit was given to the Confederates, but without overtaking them.

After his defeat at Iuka, the Confederate general Price retreated to Ripley, Miss., where he was joined by Gen. Van Dorn, raising his force to about 30,000, Van Dorn assuming command, and an attempt to take Corinth by surprise or force was determined upon. This movement began Oct. 2.

Gen. Rosecrans was now in command at Corinth with 20,000 men. To the former extensive line of defenses inner lines had been added. Grant's headquarters were at Jackson, Tenn., Ord's division was at Bolivar.

Van Dorn moved northward to Pocahontas on the Memphis R. R., thence down to Chewalla. Rosecrans, apprised of this advance, deemed it a feint on Corinth, and that the real object was to attack Grant or Ord, but to meet any emergency threw his forces well out to the west, in and beyond the outer line of fortifications.

On the morning of Oct. 3 the Confederate advance struck these troops, who offered sufficient resistance to develop the full strength of the attacking force.

No doubt now existing as to the design of the Confederates, Rosecrans prepared to resist. He had barely withdrawn and rearranged his line when a furious attack on the center forced Davies back a short distance, darkness closing the engagement.

On the morning of the 4th the attack was renewed with great vigor, and although the troops were subjected to a most severe direct and cross fire, it was pushed until Fort Richardson and even Rosecrans's headquarters were taken; but by bringing up the reserves the fort was retaken, the Confederates driven back in confusion, and the line re-established.

At the same time desperate attacks were made upon the Union left center in the vicinity of batteries Williams and Robinett, the last of which was led by Col. Rogers, Second Texas, who fell just outside the ditch of Battery Robinett. These attacks were all repulsed with heavy losses, and by counter charges the Confederates were driven back to the edge of the woods. By noon the battle was ended. The heroic bravery here displayed called forth the admiration of all. The remains of the gallant Col. Rogers, who fell at the ditch, were carefully buried in a separate grave by his foe.

The national loss in this sanguinary conflict was 355 killed, 1,841 wounded, and 324 captured and missing; total 2,520 out of a force of 20,000 engaged. Neither the strength nor losses of the Confederates is exactly known. The official records show Van Dorn to have had about 22,000 men, and to have lost on Oct. 3, 4, and 5, about 4,900 in killed, wounded, and missing, or nearly double the Union loss.

Revised by JAMES MERCUR.

Corinth, Gulf of, or **Gulf of Lepanto** (anc. *Corinthiacus Sinus*): an inlet of the Mediterranean, extending between Hellas proper, or Northern Greece, and the Peloponnesus (Morea). This gulf resembles a large inland lake. In beauty of scenery it equals or surpasses the most picturesque lakes of Northern Italy. "Its coasts," says Leake, "broken into an infinite variety of outline by the ever-changing mixture of bold promontory, gentle slope, and cultivated level, are crowned on every side by lofty mountains of the most majestic forms." It extends E. and W. nearly 80 miles, without including the part called the Gulf of Patras, which is connected with the other portion by a strait less than 2 miles wide, sometimes called the Little Dardanelles. See also LEPANTO, GULF OF.

Corinth, Isthmus of: a neck of land connecting Attica with the Morea, and separating the Gulf of Corinth from that of Ægina. Its width varies from 4 to 8 miles. This isthmus was the scene of the celebrated Isthmian games and the site of a famous temple of Neptune. (See ISTHMIAN GAMES.) A ship-canal has been constructed through the isthmus. See SHIP-CANALS.

Corinthian Order: in architecture, a form of column and entablature invented in Greece but perfected by the Romans. Its origin is uncertain, the Vitruvian legend of Callimachus and the basket encircled by acanthus leaves having been wholly discredited by modern archæology. It was not generally used in Greece before the age of Alexander (330 B. C.), and the few remaining examples differ widely from each other. In Greek hands it was treated as a variant of the Ionic, having no distinctive form of base or entablature, but characterized mainly by its slender shaft and tall, bell-shaped capital encircled by rows of acanthus leaves. In the order of the Tower of the Winds there is but one row of these leaves, and the upper part of the bell is nearly plain; in that of the Choragic monument of Lysicrates there are two rows of leaves, above which appear coupled scrolls under the corners of the abacus, with honeysuckles in the middle. The Romans greatly affected the Corinthian order, and developed it into a distinctive order by giving it a special form of base and modifying the entablature, to the cornice of which they added modillions or brackets. The Roman Corinthian capital is somewhat over one shaft-diameter in height; it consists of an abacus with concave sides surmounting a bell-shaped core, around which are sixteen acanthus leaves in two tiers. From between these spring eight stalks (*caulicoli*), out of which grow branching leaves and scrolls, which meet under the corners of the abacus, with smaller scrolls and a rosette in the middle of each side. The shaft is either fluted, as in the temple of Castor and Pollux (miscalled "Jupiter Stator") at Rome, or a smooth and polished monolith, as in the porch of the Pantheon. The whole column varies from 9⅛ to 10¼ diameters in height, and carries an entablature whose architrave is usually profiled in three unequal bands, though sometimes there are but two. The frieze is usually richly sculptured, and is surmounted by a highly ornate cornice, decorated with carved moldings, dentils, and modillions faced on the under side with acanthus leaves. Among the principal antique examples of the order are the Pantheon, the temples of Mars Ultor, Vespasian, and Castor and Pollux at Rome; the temple of Zeus at Athens, and the Maison Carrée at Nîmes, the last two being doubtless executed by Greek hands. The Corinthian order was frequently used by the architects of the Renaissance. The Capitol at Washington is a good modern example of the order. See ARCHITECTURE and ORDERS OF ARCHITECTURE.

A. D. F. HAMLIN.

Corinthians, THE FIRST AND SECOND EPISTLES OF ST. PAUL TO THE: canonical books of the New Testament. *First Corinthians* was written from Ephesus in the spring of the year 57, to rebuke the Church at Corinth for party spirit, disrespect to the apostle's authority, licentiousness, impropriety at public meetings (especially at the Holy Communion), vanity, and self-seeking. The apostle also settles some cases of conscience as to eating idol-sacrifices, and a point of doctrine as to the resurrection. *Second Corinthians.*—The first Epistle had been sent by Titus probably, whose report greatly comforted the apostle (2 Cor. vii. 4–16), so he sends him back with this second letter, which is a sober and conciliatory but earnest statement of the apostle's true and just authority. From no other source do we learn so much regarding the personality of the apostle. When he wrote he had reached Macedonia on his way to Achaia; was probably in Thessalonica. The time was the summer of 57. The best commentaries in English are by C. Hodge (New York, 1857); A. P. Stanley (London, 1855); J. A. Bett (1882); F. Godet (1885); J. J. Lias (1886–92, 2 vols.); M. Dods. *Expositor's Bible* (1889–93, 2 vols.); on First Epistle alone, by T. C. Edwards (London, 1885); C. J. Ellicott (1888). See PAULINE EPISTLES.

TWO APOCRYPHAL EPISTLES (OF THE CORINTHIANS TO ST. PAUL, AND OF ST. PAUL TO THE CORINTHIANS), existing in the Armenian, are worthless productions. English translations are to be seen in Whiston's *Authentic Records*, and Latin in J. A. Giles's *Codex Apocryphus, N. T.*, pp. 509, 510.

THE EPISTLE OF CLEMENT OF ROME TO THE CORINTHIANS has been regarded as spurious by some, but without sufficient reason, and its genuineness is now conceded. It is translated in vol. i., pp. 5–21, of the *Ante-Nicene Fathers* (New York). The so-called Second Epistle of Clement to the Corinthians is doubtless a part of the pseudo-Clementine homilies, to which it is now generally referred. See CLEMENT OF ROME.

Corinto: a port of Northwestern Nicaragua; in the department of Chinandega; on a bay of the Pacific Ocean (see map of Central America, ref. 6–H). It is connected by rail with Managua, Masaya, and Granada, and the Pacific mail-steamers touch there regularly. The trade is important, the railroad having made this the principal port of the republic. Besides the custom-house and warehouses, the town is composed mainly of adobe or straw huts. Pop. probably less than 2,000. H. H. S.

Coriola'nus, CAIUS MARCIUS: Roman hero, who, according to tradition, received the surname *Coriolanus* because he defeated the Volsci at Corioli about 490 B. C. During a famine he advised that grain should not be distributed gratis among the plebeians unless they abandoned the right or privilege of electing tribunes of the people. For this offense he was banished. Having obtained command of the Volscian army, he marched against Rome, the citizens of which were unable to resist him. He was at length appeased by a deputation of Roman matrons, led by his mother Veturia, and his wife Volumnia. The story of Coriolanus forms the subject of one of Shakspeare's dramas. See Arnold, *History of Rome.*

Corip'pus, FLAVIUS CRESCONIUS: a literary man (*grammaticus*), who was born in Africa and flourished probably in the sixth century; known as the author of an extravagant panegyric upon Justin the Younger, who was Byzantine emperor from 565 to 578 A. D., and of a poem called *Johannis*, celebrating the exploits of Johannes, a proconsul in Africa in Justinian's time. It is believed by some, but without full evidence, that he was the same Cresconius who wrote large and important collections of the canon law, and who was an African bishop of uncertain age. Corippus was a writer of ability, and those parts of his work which are now perfect are highly prized. Much mystery formerly existed with regard to the authorship of his writings, but the discovery of a fairly preserved MS. in 1814 cleared away most of the difficulties which had beset this vexed question. The above works have been often reprinted. See especially the editions by I. Partsch (Berlin, 1879) and by Mr. Petschenig (Berlin, 1886).

Cork [from Span. *corcho*, cork, *corche*, cork-shoe < Lat. *cor'tex, -icis*, bark]: the bark of the *Quercus suber*, a species of oak growing in Spain, Italy, and the south of France. The bark may be removed annually without injuring the tree. Cork is extensively used in the form of stoppers for glass bottles, and in the construction of life-preservers and life-boats. When rasped cork is digested in water and alcohol, it leaves about 75 per cent. of insoluble matter, called *suberine*. The cork-tree has been introduced successfully in the Southern U. S.

Cork: the most southern county of Ireland; bordering on the Atlantic Ocean. Area, 2,890 sq. miles. It is drained by the rivers Blackwater, Lee, and Bandon. The surface is diversified, and presents picturesque scenery. The coast is deeply indented with several bays and inlets, which form excellent harbors. Among these are Bantry Bay and the harbors of Cork and Kinsale. The predominant rocks are old red sandstone and mountain limestone. Here are mines of copper and coal. Capital, Cork. Pop. (1891) 436,641.

Cork: city; river-port and third city of Ireland; capital of Cork county; on the river Lee, 11 miles from the sea, and 136 miles S. W. of Dublin by rail (see map of Ireland, ref. 14–E). It is built partly on an island of the river, which is here crossed by nine modern bridges. Many of the houses are of stone and brick, and the main streets are wide and well-paved, but the suburbs are mean. Among the principal edifices are the court-house, mansion-house, the exchange, a custom-house, a lunatic asylum, and an episcopal palace. It contains a Protestant and a Catholic cathedral and two large Roman Catholic churches, Queen's College, the Cork Library, a medical school, two or three theaters, a fever hospital, and several convents. The chief manufactures are glass, paper, gingham, iron, gloves, etc. Cork has a large, safe, and landlocked harbor, formed by an estuary of the river Lee. The entrance, which is a mile wide, is 11 miles from the city. Queenstown is on an island

in this harbor. Cork derives much of its prosperity from commerce. It is connected by railway with Dublin and other cities. Steam-packets ply between this port and Dublin, Liverpool, Bristol, etc. Cork returns two members to Parliament. It is supposed to have been founded in the sixth century. Pop. (1891) 75,070.

Cork, Earls of (1620): Earls of Orrery (1660), Barons Boyle of Youghal (1616), Barons Broghill, Viscounts Kinalmealy, and Barons of Bandon Bridge (Ireland, 1628), Barons Boyle of Marston, Somerset (Great Britain, 1711).—Richard Boyle, ninth earl, K. P., P. C., master of the buckhounds, b. Apr. 19, 1829; succeeded his grandfather June 29, 1856.

Cork, Richard Boyle, First Earl of: a British statesman; b. at Canterbury, Oct. 3, 1566. He was made privy councilor for Ireland in 1612, raised to the peerage in 1616, became Earl of Cork in 1620, lord justice of Ireland in 1629, and lord treasurer in 1631. D. Sept. 15, 1643. He is known as "the great Earl of Cork," and was father of Robert Boyle, the philosopher.

Cormenin, kōrm'năñ', Louis Marie de la Haye, Vicomte de: French political writer; b. in Paris, Jan. 6, 1788. He became in 1828 a liberal member of the Chamber of Deputies, and under the pseudonym of *Timon* wrote political pamphlets which were successful. He was president of the committee which formed a new constitution in 1848. Among his works *Droit Administratif* (1831; 5th ed. 1840) is the most important. After the *coup d'état* of Dec., 1851, he was a member of the council of state. In 1855 he was admitted into the Institute. D. May 6, 1868.

Cormon, kōr'mōñ', Fernand: painter of historical and archæological subjects and of portraits; b. in Paris, Dec. 22, 1845. Pupil of Fromentin, Cabanel, and Portaels; medals of honor Salon of 1887 and Paris Exposition 1889; officer Legion of Honor 1889. Two large compositions are in the Luxembourg Gallery, Paris, *Cain* (1880) and *The Victors of Salamis* (1887). *The Stone Age*, exhibited at the Salon of 1884, is also a vast canvas, and all of these works are painted with great science and technical strength. It must be said, however, that the chief interest in them lies in the fact that they are reconstructions or representations of the life of other days, for which there are not many authentic documents, and the painter relies on so presenting his subjects on canvas as to give them an air of truth. In the *Cain*, which is the best of the three, there is fine composition, great breadth of handling, and strong draughtsmanship. Cormon's work is not in any sense remarkable for color. He is a figure of considerable importance in contemporary art, one of the best instructors in Paris, and as a portrait-painter is notably successful in the rendering of character. Studio in Paris. William A. Coffin.

Cormontaigne, kōr'mōñ'tăñ', Louis, de: French military engineer; b. in 1696. He made improvements in the art of fortification, on which he wrote several treatises. He planned the fortifications which were constructed at Metz and Thionville in the reign of Louis XV. D. Oct. 20, 1752.

Cormorant: any one of a family of aquatic birds (*Phalacrocoracidæ*) related to the pelicans. They are characterized by a long neck, compressed bill with a hook at the tip, wings of moderate length, and rather long, stiff tail. The feet are totipalmate, that is, all the toes, including the first, are connected by a web, and there are no external nostrils. The conspicuous pouch of the pelican is represented by a patch of bare, often highly colored, skin beneath the bill, and extending to the upper part of the throat. Cormorants occur along the seacoast almost throughout the world, except in the coldest parts, and many are found on inland waters. They usually nest in large colonies, choosing the rocky shelves of some precipitous coast, or, in warmer latitudes, the tangled shrubbery of some island. The young are blind, naked, and helpless, and do not attain their growth for some time. Cormorants live chiefly upon fish which they capture by diving, and in China and Japan these birds are trained to fish for their owners. The double-crested cormorant, *Phalacrocorax dilophus*, the common species of the U. S., is found on both coasts of North America and in the interior. Its general color is glossy, greenish black. The European cormorant, *P. carbo*, shown in the cut, also occurs sparingly on our eastern coast. Pallas's cormorant, *P. perspicillatus*, once found on the Commander islands, is extinct, and but four specimens are known to be in existence. See the Appendix. F. A. Lucas.


Cormorant.

Corn [O. Eng. *corn*, Germ. *Korn*; cf. Lat. *grā'num*]: a general name given to various seeds, especially to cereal and farinaceous grains which grow in ears and are used for food, as wheat, barley, rye, and maize. In Great Britain the term is generally applied to wheat, rye, oats, and barley, and means simply "grain." In Scotland and Ireland, however, it is commonly restricted to "oats." In the U. S. the term is restricted to maize or Indian corn. See Maize.

Corn [from Lat. *cornu*, a horn]: a horny accumulation of epidermic cells upon the surface of the human foot, produced by the pressure of the boot or shoe. Corns may be softened by hot water or poultices, and the horny part can be carefully removed with the knife. When painful, they may be generally much relieved by the occasional application of a solution of nitrate of silver. Various surgical appliances have been devised for the relief of corns, which when neglected may give rise to serious trouble.

Cor'narists: See Cornhert, Diedrik.

Cornaro, Caterina: Queen of Cyprus; b. in Venice, 1454; married James de Lusignan, King of Cyprus, and on his death in 1473 succeeded him on the throne; abdicated in favor of the Venetians in 1489. Her portrait was painted by Titian. D. 1510.

Cornaro, kōr-naa'rō, Luigi: Venetian nobleman; b. 1467; d. 1566; lived very freely up to his fortieth year, when he adopted an almost ascetic mode of life, and put himself on a diet of 12 oz. of solid meat and 14 oz. of wine a day. In his eighty-third year he wrote his *Sure Method of Attaining a Long Life*, the English translation of which has run through more than thirty editions.

Corn'bury, Edward Hyde, Lord: the grandson of Edward Hyde, first Earl of Clarendon. He deserted the service of James II. in 1688, and became an adherent of the Prince of Orange (William III.), who appointed him Governor of New York in 1702. He was censured for rapacity and tyrannical conduct, and was removed in 1708, and soon after returned to England to succeed his father as third earl. D. Apr. 1, 1723.

Corn-crake, or **Land-rail**: the *Crex pratensis*, a European bird, a rare visitant of the U. S. It is a wader, 7


Corn-crake, or land-rail.

inches long, of a brown-gray color, haunting corn and grass lands and osier-beds. It is a game bird, quite hard to flush, as it runs rapidly away from a dog.

Cor'nea [Lat. femin. of adjec. *cor'neus*, horny; deriv. of *cornu*, horn]: the transparent horny membrane which forms the anterior part of the eyeball. In vertebrates it is simple; in insects it is divided into numerous hexagonal segments. See EYE.

Corneille, kōr'nāl' or kōr'nāl', PIERRE: French dramatic author; b. at Rouen, June 6, 1606; is called the founder of the French drama. He was educated by the Jesuits, and studied law, which he practiced for several years without success. In 1629 he produced *Mélite*, a comedy, which was performed with applause. Between 1629 and 1635 he wrote several comedies which are inferior to his later works. His *Médée* (1635), a tragedy, although somewhat bombastic, contains eloquent passages, and reveals the dawning of his genius. His reputation was greatly increased by the tragedy of the *Cid* (1636), an imitation of the Spanish drama of the same name. The *Cid* was performed with great applause, and surpassed everything that had appeared on the French stage. He produced in 1639 *Les Horaces* and *Cinna*, which are excellent in invention and style. *Cinna* and *Polyeucte* (1640) are considered by some critics as his masterpieces. He was admitted into the French Academy in 1647. Among his other works are *Le Menteur* (1642), a comedy of character and intrigue, and an opera, *La Toison d'Or* (1661). He died in Paris, Oct. 1, 1684, and left several children. He was an uncle of Fontenelle. The French call him the "grand Corneille," partly to distinguish him from his brother Thomas. In the opinion of many critics he excelled other French dramatists in impressive declamation, sublime thoughts, and a condensed and noble style. See Fontenelle, *Éloge de Corneille*; Guizot, *Corneille et son Temps* (1852); Taschereau, *Histoire de la Vie et des Ouvrages de Corneille* (1829); Bouquet, *Points obscurs de la Vie de Corneille* (1888); Picot, *Bibliographie Cornélienne* (1875). Among the editions of his works is one by Marty-Laveaux (12 vols., 1862–67).

Corneille, THOMAS: French dramatist; a brother of the preceding; b. at Rouen, Aug. 20, 1625. His first work was a comedy entitled *Engagements du Hasard* (1647). He produced *Timocrate*, *Ariane*, and other tragedies, and several encyclopædic works. D. Dec. 17, 1709.

Cor'nel: a shrubby plant bearing the name of dogwood, belonging to the genus *Cornus*, which includes about twenty-five species, mostly of the northern hemisphere. The small flowers have four petals, four stamens, and an inferior two to three celled ovary, producing a fleshy fruit. The common dogwood, *Cornus florida*, of the Eastern U. S. is a small tree yielding a hard wood resembling boxwood. The dwarf cornel, or bunch-berry, *C. canadensis*, is a low herb growing in cold, damp woods in the North. There are, all told, eighteen species in North America. CHARLES E. BESSEY.

Corne'lia, mother of the Gracchi: See GRACCHUS.

Cornelian, or **Carnelian**: See CHALCEDONY.

Corne'lius, ELIAS, D. D.: clergyman; b. at Somers, Westchester co., N. Y., July 31, 1794. Graduated at Yale College 1813; he became missionary to the Cherokee and Chickasaw Indians, and greatly helped the cause by his book *The Little Osage Captive* [Lydia Carter], *an Authentic Narrative* (New York, 1821; 3d ed. Boston, 1837). In 1819 he became colleague of Rev. Samuel Worcester, at Salem, Mass. In 1826 he became secretary of the American Education Society, in which capacity he gave a notable impulse to the work of training men for the Christian ministry. D. at Hartford, Conn., Feb. 12, 1832. A few weeks before his death he succeeded Jeremiah Evarts as one of the secretaries of the A. B. C. F. M. His life was written by B. B. Edwards (Boston, 1833; 2d ed. 1834; rep. Edinburgh, 1834).

Cornelius, PETER, von: historical painter; b. at Düsseldorf, Sept. 23, 1783; d. in Berlin, Mar. 6, 1867; pupil of Düsseldorf Academy; director of the Academy; executed the Iliad frescoes in the Glyptothek, Munich, 1822–30; from 1841–61 executed a series of frescoes for the cemetery in Berlin. Important works besides these are *The Last Judgment*, Ludwigs Kirche, Munich; *Hagen Sinking the Niebelungen Hoard*, National Gallery, Berlin; Dante frescoes in the Villa Massimi, Rome. W. A. C.

Cornelius Nepos: See NEPOS.

Cornell, ALONZO B.: b. at Ithaca, N. Y., Jan. 22, 1832; son of Hon. Ezra Cornell, founder of Cornell University; educated at the academy in Ithaca; telegraph operator for some time; manager of Cleveland telegraph office 1848, and 1855–59 of principal telegraph office in New York city; 1864–69 cashier and vice-president of First National Bank of Ithaca; afterward first vice-president of Western Union Telegraph Company; chairman of Republican county committee 1859–66; in 1868 Republican candidate for Lieutenant-Governor of New York; surveyor of port of New York 1869–72; in 1870 was first elected chairman of Republican State committee; speaker of Assembly in 1873, 1875–76 and 1878; naval officer of New York in 1876; Governor of New York 1880–83.

Cornell, EZRA: founder of Cornell University; b. at Westchester Landing, N. Y., Jan. 11, 1807. Soon after the invention of the telegraph he devoted his attention to that enterprise, and in its development acquired a large fortune. He served in the New York State Senate, and in 1865 founded the CORNELL UNIVERSITY (*q. v.*). D. Dec. 9, 1874, at Ithaca, N. Y. His *Life*, by Alonzo B. Cornell, was published for private circulation in 1884.

Cornell, JOHN HENRY: organist, composer, and teacher; b. in New York city, May 8, 1828; received his musical education partly at home and partly in Germany. He was for many years the organist and choir-director of St. Paul's chapel, New York. After resigning that position he devoted himself exclusively to teaching and the writing of books of an educational character. His *Primer of Modern Tonality* (1876) attained considerable popularity, and his *Musical Form* is a very valuable treatise. His compositions are not many and are entirely sacred. D. in New York, Mar. 1, 1894. D. E. HERVEY.

Cornell College (Mt. Vernon, Ia.): an institution under the direction of the Upper Iowa and the Northwest Iowa Conferences of the Methodist Episcopal Church. The history of the school began in 1852, Miss A. C. Fortner being the first teacher. At the more formal organization as a seminary, Rev. Samuel M. Fellows, M. A., afterward president of the college, became the first principal. The school was founded and sustained during the earlier years of its existence by the self-sacrifice and earnest effort of the pioneer settlers of Mt. Vernon and vicinity under the leadership of Rev. George B. Bowman, D. D. A college organization was effected in 1857. The art hall, science hall, Bowman hall, and the main college building are of brick. The chapel is of stone, two stories high, built in the modern Gothic style of architecture. Besides the four regular college courses, classical, philosophical, scientific, and civil engineering, there are preparatory, normal, art, and musical departments. The president, Rev. W. F. King, D. D., LL. D., has been at the head of the institution since 1863. The faculty consists of 36 professors and teachers, and the enrollment of students in 1900 was 689. For sixteen years the general Government has detailed an army officer to give military instruction to the students. In addition to the general endowment, three chairs have been endowed by gifts of the late Bishop L. L. Hamline, the Hon. D. N. Cooley, and the alumni. The history of the institution has been marked on account of its high intellectual and religious standards. HAMLINE H. FREER.

Cornell University: a collegiate institution at Ithaca, Tompkins co., N. Y. In July, 1862, Congress granted to each State 30,000 acres of public land for every Senator and Representative it was entitled to, the income to be applied for ever to colleges "where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, . . . in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life." One-tenth of this may be used for experimental farms, but no portion for buildings. New York's share was 990,000 acres. By charter of 1865 and 1867 the Legislature of the State established the Cornell University with a foundation of $500,000, given it by Hon. Ezra Cornell, of Ithaca, and secured to it the entire income of the land-grant. During several years after the establishment of the university the price of land scrip was so low that very little could be realized from the Federal endowment. At length, however, Mr. Cornell secured the passage of a law by the Legislature of the State of New York authorizing him to purchase the scrip at the current market price, on condition that all the profits accruing from the location and sale of the lands represented by such scrip should be turned over to the university as a part of the Cornell Endowment Fund. The lands located by Mr. Cornell under this authority were very largely pine-lands in Wisconsin, and were held until

1881, when, in consequence of the great increase in the value of timber, the university was able to realize a large profit. In the course of the next ten years the sales amounted to about $5,000,000. In addition to the sum thus realized the university has received large amounts from private benefactors. Mr. John McGraw erected the McGraw Hall at an expense of $140,000; Mr. Hiram Sibley founded Sibley College; Mr. Henry W. Sage gave $250,000 for Sage College for women, $30,000 for Sage Chapel, $260,000 for the Sage School of Philosophy, and $560,000 for the General Library Building and its endowment; Mr. A. S. Barnes gave $45,000 for the erection of a building for the Students' Christian Association; and President Andrew D. White gave his library of history and political science, valued at $100,000, besides nearly or quite $100,000 more in miscellaneous gifts.

The university was opened in the autumn of 1868. Though the number of students from the very first was large, it was not until after the material equipment was greatly increased by the sales following 1881 that the growth of the university became remarkable. In 1882 the number of students was 382; in 1900 it was 2,776. Andrew D. White, LL. D., was president from 1865 to 1885; Charles K. Adams, LL. D., from 1885 to 1892; Jacob G. Schurman since 1892. The university includes the College of Agriculture, the Sibley College of Mechanical and Electrical Engineering, the College of Civil Engineering, the School of Law, the Course in Architecture, the Course in Arts, the Course in Philosophy, the Course in Science, and the Course in Letters. In many of the departments the equipment is very extensive. Since 1872 both sexes have been admitted on equal terms. The university bestows thirteen fellowships of $400 each, two of $500 each, and twelve scholarships of $200 each. The grounds of the university consist of 270 acres, picturesquely situated about 450 feet above Cayuga lake.

C. K. Adams.

Cor'net [from Fr. *cornette*, dimin. from Lat. *cor'nu*, horn]: a musical instrument usually of brass, and originally of a curved, horn-like shape. Cornets are of various kinds, but the best form is that known as the *cornet-à-pistons* (a French term signifying a "cornet with pistons," because modifications of sound are produced by small pistons moved by the player's fingers).

Cor'net [Ital. *cornetta*, a small flag]: a commissioned officer of cavalry, corresponding in rank with the ensign of infantry. The standard was formerly carried by the cornet, hence the name. There are no cornets in the U. S. army.

Corn-flower, or **Bluebottle** (*Centaurea cyaneus*): a composite weed common in European grain-fields and cultivated in gardens in the U. S.; admired for the rich blue color of the outer barren florets.

Corn'hert, or **Koornhert**, Diedrik: Dutch author and reformer; b. at Amsterdam in 1522. He efficiently promoted the Protestant Reformation, but opposed Calvinism; wrote a *Treatise against the Capital Punishment of Heretics*. He gave valuable assistance to the Prince of Orange in his contest against Spain, and became secretary of state in Holland in 1572. D. Oct. 20, 1590. His followers, who were called Cornarists, disappeared from history after the rise of the Arminian party in the Dutch Church.

Cornice: the upper and projecting or crowning portion of a wall. It is often made very ornamental by means of rich moldings, carving, inlay of colored material, or by all these means. In Greek and Græco-Roman architecture, and in all the styles derived from these, it forms the upper part of an entablature and consists of a bed-mold, corona, and cymatium or gutter, and sometimes other members, as dentils or modillions. See Entablature.

A. D. F. Hamlin.

Corniferous Limestone [*corniferous* is from Lat. *cornu*, a horn + *ferre*, bear]: a formation of the Devonian period occurring in New York, Pennsylvania, Ohio, and Canada. It is characterized by a large invertebrate fauna, and contains remains of fish. Certain layers are extensively quarried for lime and for building material, but the greater portion of the formation is rendered unfit for these uses by the abundance of the chert, or hornstone, whence its name is derived.

G. K. G.

Cornifi'cius: a writer on rhetoric, mentioned several times by Quintilian. The treatise commonly cited under the title of *Auctor ad Herennium*, and formerly attributed to Cicero, with whose works it is usually printed, is now commonly ascribed to Cornificius. The work, in four books, is the most admirable Roman manual upon rhetoric extant, and must have been composed about 84 B. C., as it was used by Cicero in his youthful treatise *De Inventione*. See editions by C. L. Kayser (Leipzig, 1854); G. Friedrich (part i., vol. i., of the Teubner Cicero, Leipzig, 1884), and F. Marx, who denies the authorship of Cornificius and has published the text under the title *Incerti Auctoris de ratione dicendi and C. Herennium libri IV.* (Leipzig, 1893). M. Warren.

Corning: town (founded in 1869); capital of Adams co., Ia. (for location of county, see map of Iowa, ref. 7–E); situated on Ch., Bur. and Q. R. R., and on East Nodoway river; 80 miles E. S. E. from Council Bluffs. The town has 6 churches, an academy, 2 public schools, 4 canning-factories, cheese-factory, 2 butter-factories, fruit-drying establishment, 3 stone-quarries, flour-mills, and tile and brick works. Pop. (1880) 1,526; (1890) 1,682; (1900) 2,145.

Editor of "Adams County Gazette."

Corning: city (incorporated in 1890); one of the capitals of Steuben co., N. Y. (for location, see map of New York, ref. 6–E); on the Chemung river, and the Del., Lack. and W., the Erie, and the Fall Brook railways; 20 miles W. of Elmira. It has gas and electric light plants, brick and stone pavements, efficient sewerage, and water-works owned by the city. There are 7 churches, 4 public-school buildings, city-hall that cost $50,000, public library, St. Mary's Orphan Asylum, 2 banks, 2 daily newspapers, and manufactures of railway cars, flint and cut glass, building and paving brick, terra-cotta work, marble and granite monuments, flour, lumber, stoves, furnaces, cigars, wagons, and sash and blinds. The tobacco-crop of the Chemung and neighboring valleys is largely handled here. Pop. (1880) 4,802; (1890) 8,550; (1900) 11,061.

B. W. Wellington.

Corning, Erastus: capitalist; b. at Norwich, Conn., Dec. 14, 1794; became a wealthy iron-merchant of Albany, N. Y., and was a member of Congress from the last-named State 1857–63 and 1865–67. He was one of the leading railroad capitalists of the U. S., was one of the regents of the University of the State of New York, and was greatly interested in the cause of popular education. D. Apr. 9, 1872.

Cornish Language: a branch of the Keltic family of languages, and nearest related to the Bretonic and the Welsh. It was spoken in Cornwall down into the eighteenth century, but has been so completely displaced by English that in recent years there remained but a few old people who could recall some scattered Cornish words. The literary records date, with the exception of two older vocabularies, from the end of the Middle Ages or the beginning of modern times. They consist of a series of religious dramas, the so-called mysteries, and a poem on the passion of Christ. Their titles are all enumerated by H. Jenner in the *Transactions of the Philological Society* (London, 1873–74). The word-material of Cornish is collected in R. Williams's *Lexicon Cornu-Britannicum* (1865). The best grammar is contained in the *Grammatica Celtica*, revised by Ebel (1871).

R. Thurneysen.

Corn-laws: laws regulating the trade in grain; specifically the laws enacted by the British Parliament controlling the exportation or importation of grain. In feudal times the legislation of European countries was directed to lowering the price of food products, and to this end the exportation of grain was prohibited, but in England this policy was found to press heavily upon the agricultural classes, and in 1436 Parliament passed a law permitting exportation when the price of grain fell below a certain limit. Heavy duties, however, were still imposed. In William and Mary's reign these duties were abolished and bounties were granted to exporters. In the meanwhile the Government had sought to keep up the price by prohibiting or taxing imports. A law passed in 1463 prohibited importation, and subsequent statutes held it in restraint by high duties. All through the eighteenth century these two methods of keeping up the price—the granting of bounties and the heavy taxation of imports—marked Great Britain's policy in dealing with the grain trade, but in 1814 bounties were abolished. In 1815 a law was passed making 80*s.* a quarter the price at which importation might begin. In 1822 this law was amended so as to permit importation when the price reached 70*s.* a quarter. The price did not rise to this point, and a further change was made in 1828. When the price was 59*s.* to 60*s.* a quarter foreign grain was admitted with a duty of 27*s.*; when the price rose above 73*s.* the duty fell to 1*s.*, and be-

tween these two extremes of price the duty varied. This was the principle of the sliding scale, more fully applied in this than in any previous statute.

After the Reform Bill of 1832 secured for the manufacturing classes and the great towns representation in Parliament, opposition to this protection of the landed interests began to make itself felt, and in 1834 a motion was offered to impose a fixed duty instead of the sliding scale. It was lost, and a motion for repeal introduced in 1837 met with the same fate. Henceforth the chief opposition to the corn-laws came from outside of Parliament. At Manchester in 1838 (or, as some say, in Jan., 1839) was formed an anti-corn-law association, which later, under the name of the Anti-Corn-law League, entered upon a campaign of agitation for repeal. Its leader was Richard Cobden and its most eloquent spokesman John Bright. Representing that cheap food would follow the remission of duties and that the corn-laws were solely in the interest of the landowners, the league constantly won new adherents both in and out of Parliament. In 1842 Peel caused a further modification of the corn-law, improving the operation of the sliding scale, but this did not placate the foes of protection. The potato blight in Ireland in 1845, followed by the failure of the corn crop in England, caused one of the worst famines of modern times. The high price of corn in the midst of the general distress gave the league its opportunity. Its agitation became more vigorous; Peel, then Prime Minister, was converted to its doctrines, and in Jan., 1846, declared himself in favor of repeal. An act providing for the gradual abolition of duties was passed June 25, 1846, and Great Britain has never since returned to the policy of protecting corn. The effect of the repeal measure is a matter of controversy between free-traders and protectionists. The latter point to the depression of agriculture in recent years as a consequence of the change of policy. F. M. Colby.

Cornplanter [Iroquois, *Garianwachia*, the planter]: a half-breed Seneca Indian and chief of the Six Nations; b. about 1732; the son of John Abeel or O'Bail, a white trader. He aided the French against the English, and was a deadly foe to the colonists during the Revolutionary war, but afterward became the steady friend of the white people. He was a man of great intelligence, dignity, and moral worth. D. in Warren co., Pa., Feb. 18, 1836. A monument was erected in his honor by the State of Pennsylvania in 1867. See Snowden, *Historical Sketch of Cornplanter* (1867).

Corn-snake: the *Coluber guttatus*, a colubrine, non-venomous serpent of the Southern U. S., of a brown color, and often 5 feet long. It is generally not seen except mornings and evenings. It enters houses, devours young chickens and other small animals, but is of gentle and familiar disposition.

Cornu, Julius: Professor of Romance Philology in the University of Prague; b. at Basel, Feb. 24, 1849. He is one of the collaborators in Gröber's *Grundriss der romanischen Philologie*, and has published important studies, especially upon Spanish and Portuguese subjects; e. g. *Glanures phonologiques* (1873); *Études sur le poème du Cid* (1881; 1890). A. R. M.

Cornucopia [for Lat. *cor'nu co'piae*, horn of plenty]: in the fine arts, an ornament representing a horn, from which issue flowers, fruits, and leaves. The fable accounting for the origin of this emblem of plenty is that Amalthæa, when one of her goats had broken off a horn, presented it to the infant Jupiter wreathed with flowers and filled with fruit.

Cornu'tus, L. Annaeus: a Stoic philosopher of Leptis, in Africa, who lived in Rome under Nero, and was the teacher and friend of Persius, whose satires he edited. He was banished by Nero together with Musonius Rufus. Of his works we have only a manual in Greek, known as *De Natura Deorum*, compiled for studious youth from the etymologizing and allegorizing mythologies of the earlier Stoics. Edited by Osann (1844) and C. Lang (1881). B. L. G.

Cornwall: a county forming the S.W. extremity of England; bounded by the ocean on all sides except the E. It constitutes a duchy, which is the appanage of the Prince of Wales. Area of the county, 1,350 sq. miles, but the duchy is larger, and includes a part of Devonshire. The surface is partly occupied by rugged hills, with some fertile valleys. The river Tamar forms the eastern boundary of Cornwall, which it separates from Devonshire. The extreme western point of the county is a promontory called Land's End. Cornwall is rich in metals, especially tin and copper. The mining of kaolin and felspar is also important. Silver, lead, zinc, antimony, cobalt, bismuth, and iron are found here. The mines of Cornwall are deteriorating, however, both with respect to the quantity and with respect to the quality of their yield. The pilchard, herring, and mackerel fisheries are extensive. The chief towns are Falmouth, Penzance, Bodmin, and Truro. There are in Cornwall many dolmens and other prehistoric remains. The ancient language of Cornwall, called the Cornish language, ceased to be spoken about the end of the eighteenth century. (See Cornish Language.) Capitals, Bodmin and Launceston. Pop. (1901) 322,857.

Cornwall: a port of entry; capital of Stormont co., Ontario, Canada (see map of Ontario, ref. 2–I); on the north side of the St. Lawrence river, at the foot of the Long Sault Rapids and Canal, 67 miles above Montreal, and on the Grand Trunk Railway. It has 8 churches, 6 schools, great water-power, and manufactures of cotton and woolen goods, paper, flour, etc. Pop. (1891) 6,805; (1893) estimated with suburbs, 9,000. Editor of "Freeholder."

Cornwall, Barry: See Procter, Bryan W.

Cornwallis, Charles, Marquess of: a British general; b. Dec. 31, 1738; eldest son of the first earl, whose title and estate he inherited in 1762. He became a favorite aide-de-camp of the king, but he opposed the measures that provoked the war of 1775–81 with the American colonies. He was ordered to North America in 1775, and with the rank of major-general took part in the battles of Brandywine and Germantown in 1777. Having obtained the command of an army in South Carolina, he defeated Gen. Gates at Camden Aug. 16, 1780. Mar. 15, 1781, he gained some advantage over Gen. Greene at Guilford Court-house, and invaded Virginia. He occupied Yorktown, which he intrenched, and remained on the defensive. Gen. Washington besieged Yorktown, and compelled Lord Cornwallis to surrender his army of about 8,000 men Oct. 19, 1781. He is regarded as the ablest of the British generals who commanded in this war. In 1786 he was appointed governor-general of Bengal and commander-in-chief of the army in India. He waged war against Tippoo Sahib, whom he defeated at Seringapatam in 1792. Having returned to England in 1793, he was raised to the rank of marquess. He became in 1798 Lord-Lieutenant of Ireland, which was then the scene of a rebellion, and he pacified the Irish by moderate measures. He negotiated the treaty of Amiens in 1802, and was appointed Governor-General of India in 1805. He died at Ghazipur in India in the same year, Oct. 5. See his *Correspondence*, edited by Ross (3 vols.; 2d ed. 1859); also Johnston's *The Yorktown Campaign* (New York, 1881).

Cornwall on the Hudson: village; Orange co., N. Y. (for location of county, see map of New York, ref. 7–J); situated on the N. Y., Ont. and West. and the West Shore railways, and on Hudson river; 5 miles S. of Newburg. It has a public library, brick-yards, and several factories, and is a place of summer resort. Pop. (1890) 760; (1900) 1,966.

Co'ro: a former province of Venezuela; now the north-eastern part of the state of Falcon.

Coro: city of Venezuela; capital of the state of Falcon; on low land near the coast (see map of South America, ref. 1–C). It has a considerable export trade in coffee, cacao, tobacco, and goat-skins, known as Curaçoa kid-skins. The climate is hot and unhealthy. Coro was founded in 1527, and until 1576 was the capital of the province of Venezuela. Pop. (1891) 9,000. H. H. S.

Corœ'bus (in Gr. Κόροιβος): one of the half-mythical characters of early Greek history; an Elean chiefly noted for his victory in the foot-race at the Olympian games in 776 B. C. From this victory the Olympiads were reckoned. He slew the monster Pœne, whom Apollo sent to afflict the Argives.—Another Corœbus was a Phrygian hero of the Trojan war, and a suitor of Cassandra.—In Pericles's time there was a famous architect named Corœbus.

Corol'la [Lat., a little crown, dimin. of *coro'na*, crown]: in botany, the inner floral envelope of a plant. It is usually more richly colored than the calyx. Theoretically considered, the corolla is composed of modified leaves (called petals). Corollas are divisible into two classes, monopetalous and polypetalous, the latter of which have several distinct petals. The monopetalous corolla has only one petal, formed by the union of several modified leaves. The corolla is much employed by botanists in their systematic arrangements, and by the French school has been taken as the means of forming fundamental characters of the sub-classes in the grand division of exogenous plants.

Cor'ollary [from Lat. *corolla'rium*, a chaplet, a present given to actors, etc., a fee, gratuity, i. e. something additional; deriv. of *corol'la*, dimin. of *coro'na*, crown]: in mathematics, denotes something in addition to the demonstration —viz., an inference or consequence immediately deducible from the demonstration of a proposition. All the corollaries in modern editions of Euclid have been inserted by editors; they may be said to constitute so many new propositions, differing from the original ones merely in the fact that the demonstrations have been omitted.

Coroman'del Coast: the greater portion of the eastern coast of Madras, India; extending from Point Calymere to the mouth of the river Kistnah. It has no good harbor, and is heavily surf-beaten. The cities of Madras, Tranquebar, and Pondicherry are on this coast.

Coromandel Gooseberry: See CARAMBOLA.

Coro'na [Lat., crown]: a halo or crown of light of great beauty encircling the dark body of the moon during a solar eclipse. In a total eclipse the body of the sun is completely hidden by the interposition of the moon. Although so conspicuous on these rare occasions, the actual light of the corona is so faint as to be drowned out by the brightness of the earth's atmosphere on every other occasion except that of a total eclipse. It was for some time an open question whether this light belonged to the sun, or whether it was caused by the reflection of sunlight from a very rare atmosphere or other matter around the sun. It is not uniform in texture, but consists very largely of lines, filaments, and rays, the former sometimes extending out to a distance of two or three degrees, or several millions of miles. Probably it shines mostly by reflected sunlight, as its light has been found to be polarized. It also shines in part by its own incandescence. It is sometimes called a solar atmosphere; this expression, however, is rather misleading, since an atmosphere in the ordinary sense could not exist at so great an elevation above the surface of the sun. Besides, comets have passed through the region of the corona with a velocity of several hundred miles a second, without suffering any retardation, which would have been impossible had they encountered an atmosphere. It appears to consist of minute isolated particles, thrown out by the sun, and either falling back again or held in suspension by forces of which we have otherwise little knowledge.

Observations upon the corona have been conducted by the human eye, the photographic plate, the spectroscope, and the polariscope. To the eye and the camera the corona appears to have a shape and a structure which is quite definite and indicates a peculiar type of force acting therein. It may be divided into three parts: (1) two polar regions, around the sun's north and south poles respectively of the axis of rotation; (2) the four quadrantal eminences in the neighborhood of the parallels 40° from the poles, which gives a quadrilateral figure to the whole; (3) the equatorial extensions which are nearly parallel to the plane of the ecliptic. A close examination of the pictures shows that the polar regions are traversed by sharply defined straight and curved lines, at the poles being nearly radial, but curving more sharply away from the radii extended, in proportion to the angular distance of the radii from the pole. These lines are associated into separate rays, some being distinct from the others. The quadrantal and the equatorial extensions are nebulous structureless masses, which are sometimes crossed by true radiating lines. The writer has worked out a theory which seems to explain many of the phenomena that have been described. See *The American Journal of Science* (Nov., 1890, and July, 1891) and *The Publications of the Astronomical Society of the Pacific* (No. 16, 1891). Without specifying the physical origin of the force, it is assumed to be in accordance with the Newtonian potential in the case of repulsion, represented by the formula $N = \frac{8\pi}{3} \cdot \frac{\sin^2\theta}{r}$, where N is a constant and $r.\theta.$ the polar co-ordinates of a point on a ray. It leads to the following conclusions: The coronal rays are similar to the lines of force surrounding a spherical magnet, the poles of the axis of magnetization being about $4\frac{1}{2}°$ from the poles of the axis of rotation, the south coronal pole preceding the north by about 100° of solar longitude. The visible lines of force, instead of belonging indifferently to all parts of the surface of the sun, appear to be confined to two belts, one in each hemisphere, say 12° wide, the middle parallel of the belt located at a polar distance of 34°. The rays spring up from these belts and curve over toward the equator like immense rockets, forming from their size and length the most magnificent streamers in the solar system. They may be said to be the prototype of the terrestrial auroras; in fact, the solar and the terrestrial systems have several points of resemblance, and they no doubt are also connected with each other through the intervening space, as is suggested by actions known to occur almost simultaneously on the sun and the earth. These rays are seen by the observer as projected on the background of the sky, those in front centrally forming the polar separated streamers, the curves depending on the lines of projection; those toward the sides of the belt as it passes around the edge of the sun overlapping, and making the nebulous quadrilateral eminences. The action of the originating force tends to transport fine material from the poles of the sun toward the equator, and this may have gradually accumulated the equatorial extensions, and perhaps the matter of the zodiacal light through which the radiant sunlight is seen streaming in straight lines. The coronal poles in all probability rotate with the sun, implying some kind of a nucleus within its photosphere, and the synodic period of rotation from three eclipses has been computed to be 26·677 sidereal days at solar latitude ± 85·5°. This result will need further study in future eclipses.

This solution of the problem agrees with the facts derived from other sources. The spectroscope shows that the corona consists of fine solid particles like dust, and incandescent gases, as indicated by certain lines, namely, the green line 1474 (coronium), C. F. H. K. of hydrogen, an unmatched line (helium), and traces of some of the metallic lines. It is also rich in the ultra violet actinic rays suitable to photography. The polariscope indicates that there comes to us reflected light which is polarized in planes radiating from the center of the sun, these planes being somewhat disturbed in the coronal belt region, as also is the case with the number of the solar prominences which show a falling off at the same latitudes. The evidence is very good that the force chiefly concerned in distributing matter about the sun is of the same general nature as electric and magnetic forces, if not identical with them.

While much has been done to clear up its mystery from an astronomical point of view, the real nature or the physics of the subject yet remain to be elucidated.

FRANK H. BIGELOW.

Corona: in architecture, the flat, square, massive member of a classical cornice, often called the drift or larmier; situated between the cymatium and the bed-molding. Its use is to carry the water, drop by drop, from the building.

Corona, Coronet, or Crown: a botanical term applied to an appendage in the interior of the corolla of some flowers. In some cases the corona has the form of a cup, as in the narcissus. Formerly the corona was regarded as composed of modified stamens, or supernumerary petals; the tendency now is to regard it as composed of united petaline stipules. The five hooded bodies seated on the tube of the stamens of the asclepias are called the *crown*.

Corona: village; now a part of the Borough of Queens, New York City; on Long Island R. R.; 2 miles W. of Flushing; has manufactories of door-knobs, portable houses, etc. Pop. (1880) 750; (1890) 2,362.

Corona Austra'lis, or Southern Crown: a constellation of the southern hemisphere; about the knee of Sagittarius; scarcely visible in the northern temperate zone.

Corona Borea'lis, or Northern Crown: a small but very beautiful constellation between Hercules and Boötes; formed of a semicircle of stars which may be seen near the zenith from May till July.

Coronach, kor'ō-năk, [Gael. *coranach*, a crying, dirge; *comh*, with + *ran*, shriek]: a funeral dirge or lament, mingled with the shrieks and wailings of women; formerly heard in Scotland, especially in the Highlands. The funeral dirge, which is still used at wakes in remote parts of Ireland, is commonly known as the *keen*. Traces of the same practice are found among many primitive peoples.

Coronado: See VASQUEZ.

Coronation [from Lat. *corona'tio*, the crowning; deriv. of *corona're*, to crown]: the act of crowning a monarch; the ceremony of placing the crown upon the head, commonly performed at the time of or soon after the accession of a sovereign to the throne. In some countries of Europe it is customary for a bishop to place the crown on the head of the sovereign. In others, as in Prussia, the crown is sometimes placed upon the head by the monarch himself. The cere-

mony of coronation is a very ancient one, at least as old as King Solomon's time. Anointing often accompanies the coronation, and in Great Britain the sovereign also takes an oath to support the laws, customs, and statutes, the laws of God, the Protestant Reformed religion, the Church of England, etc.; security for the Church of Scotland being promised in the oath of accession, which in some instances long precedes the coronation. For example, George IV.'s accession was Jan. 29, 1820, but his coronation was deferred nearly eighteen months—till July 19, 1821. The ceremony of coronation is not necessary to the authority of a monarch. Revised by C. K. Adams.

Coroner, anciently **Crowner** [literally, an officer of the crown; Lat. *coro'na*]: formerly an officer of high dignity, who served as a deputy of the crown and as chief justice of the king's bench in England. At present, in England and most of the U. S., a coroner is an officer who in case of sudden or mysterious death summons a jury, which sits in sight of the body, to determine the cause and manner of death. Coroners may commit persons suspected of homicide after inquest, without warrant, for trial, and are empowered, in the U. S., to take ante-mortem statements. They also hold inquests in regard to salvage from shipwrecks. They had anciently powers much greater than at present.

Coronet [dimin. of O. Fr. *corone* < Lat. *coro'na*, crown]: in heraldry, an inferior crown belonging to the nobility. The monument of John of Eltham (second son of Edward II.), who died in 1334, is said to afford the earliest English representation of this ornament.

Coronium: See the Appendix.

Corot, kō′rō′, Jean Baptiste Camille: landscape-painter; b. in Paris, July 20, 1796. Pupil of Michallon and Victor Bertin; second-class medal, Salon, 1833; first-class medals, Salon, 1848, and Paris Exposition, 1855; second-class medal, Paris Exposition, 1867; officer Legion of Honor 1867. His father, a native of Rouen, marrying a milliner, took up her business, and in a shop in the rue de Bac in Paris accumulated a competence. Corot as a boy was sent to school at Rouen, remaining there seven years. From school he went to a clothmaker's shop in Paris, and there spent eight years. In his holiday walks along the borders of the Seine at Rouen, and at the lovely Paris suburb Ville d'Avray, where his parents had a little summer home, he grew to love nature, before long set up an easel in his bedroom, and meeting Michallon, a young painter, and getting an insight of what art really meant, resolved to devote himself to it. His father, finding his son's purpose inflexible, guaranteed him a pension of 1,500 francs a year, and on this modest pension Corot lived for thirty years, working early and late. His first instructor was Michallon, who counseled him to put himself face to face with nature, and try to paint what he saw. When Michallon died, soon after he began to work with him, Corot went to Bertin, who had been Michallon's master, but who was himself a severe classicist of the Poussin school. His influence did little to take away the truth to nature that Corot's temperament and work up to that time had made so strong in his studies, and he learned from Bertin to draw accurately and to pay attention to composition and style. In 1825 he went to Rome and Naples, returning to Paris in 1827. He sent his first picture to the Salon in 1827, and exhibited there regularly every year until he died. He visited Italy again in 1834 and in 1842, and in his later years traveled in France, Switzerland, the Low Countries, and went once to England. He never married, and lived chiefly at Ville d'Avray, where he painted many of his pictures. He always had a studio in Paris, and went into almost no other society than that of his fellow-artists, who loved him deeply and erected a monument to his memory at Ville d'Avray in 1880. As a landscape-painter he stands as the greatest and most poetical painter in the movement, begun by Delacroix and Géricault, that discarded classicalism and conventional forms, and turned the attention of artists to nature itself for their inspiration. Less naturalistic than Daubigny, who must be considered his greatest rival, his work is always founded on truth, and is pre-eminently true to nature in its great facts. He is a type of the synthesist in painting, suppressing detail to obtain unity of effect, and making the most of the great things in nature as they present themselves to the eye in mass. He is a fine, though not a profuse, colorist, and the tone of his best landscapes is indescribably beautiful and tender. Corot painted figures sometimes, and some single figures of peasant women are fine in color and general aspect. He painted the nude occasionally, but with varying success. There are several works by Corot in the Louvre; a number, including *The Evening Star* and *Biblis*, a landscape with a little figure of the nymph, probably his chief masterpiece, are in private galleries in the U. S., and his *Dante and Vergil* is in the Boston Museum of Fine Arts. D. in Paris, Feb. 23, 1875. William A. Coffin.

Corpan'cho, Manuel Nicolas: Peruvian poet; b. in Lima, Dec. 5, 1830. In 1851 he made his *début* in literature with a drama, *El Poeta cruzado*, which received warm commendation in Peru and Chili. The same year he finished his medical studies, and was sent to Europe by the Government to study and travel. In 1853 he returned to Peru, and many lyrics by him appeared in the *Lira Patriótica*, a publication in honor of the anniversary of the battle of Ayacucho. In 1854 a volume of poems by Corpancho was published in Paris, entitled *Ensayos poéticos*. In 1855 appeared the drama *El Templario*. Besides these, a variety of shorter productions came from his pen. D. Sept. 13, 1863. A. R. Marsh.

Corporal [a corruption of Ital. *caporale*, deriv. of *capo*, head, chief; Lat. *caput*]: a non-commissioned military officer; next in rank below a sergeant. He is distinguished by two chevrons worn on the arm. A "lance corporal" is a private soldier who is allowed to wear one chevron as a mark of distinction. He may or may not perform the duties of a corporal, but he has no increase of rank or pay.

Corporal [from Lat. *corpora'lis*, belonging to the body (*cor'pus*)]: in the Greek and Roman Catholic churches the altar-cloth upon which the Eucharistic species and the vessels containing them are placed. A "corporal oath" is an oath sworn upon the corporal. The name is retained by the ritualistic party of the Anglican Church.

Corporal Punishment: See the Appendix, also Bastinado, Flogging, Knout, and Whipping-post.

Corpora Quadrigemina: See Brain.

Corporation [from Lat. *corpora'tio*, embodiment, body; deriv. of *corpus*, body]: in law, an artificial person, consisting of one or more individuals, having certain legal capacities, such as succession of members, powers to sue or to be sued, and to act, no matter how numerous its membership may be, as a single individual. This new person is to be thought of without reference to the members of which it is composed. It must be carefully distinguished from a partnership, in which there is merely a collection of persons, no artificial person being constituted. A contract made with the corporation is not made with the members, nor do they, in a legal point of view, own its property, though they may have an interest in its management on the theory of a trust. Corporations may be considered under the following divisions: I. Their various kinds; II. Their mode of creation; III. Their powers; IV. Visitation; V. Dissolution.

I. They may be variously classified, as regard is had to the number of members, their objects, and the fullness of their powers. When considered as to numbers, they are either aggregate (more than one) or sole. When regarded as to the objects to be accomplished, they are ecclesiastical or lay, while lay corporations are either civil or eleemosynary. It can scarcely be said that there are any "ecclesiastical" corporations in the U. S., in the proper sense of the term. They rather belong to the English law under the rules of an established Church. Corporations in the U. S. may be said to be lay. The term "eleemosynary" is substantially equivalent to "charitable," and embraces all that large class of corporate institutions established to promote religion or learning, to relieve the sick or the poor, and in general to accomplish meritorious public objects. Another division of corporations is public and private. A public corporation is designed for governmental purposes, as a city or a village. Others are private. The importance of this distinction lies in the fact that a public corporation, being a mere instrument of government, can be created or dissolved by the law-making power at will, while a private corporation only comes into existence by *the conjunction* of the will of the sovereign power and that of the corporators. Its charter is in the nature of a contract, and it can only be dissolved by an observance of the rules governing the dissolution or impairment of the obligation of contracts. When a corporation is regarded as to the completeness of its powers, it may be either one of full powers or imperfect in its character. In the last case it is termed a *quasi* corporation. Towns in the New England States are true corporations; in New York

they are political divisions with certain specified powers, being *quasi* corporations.

II. A corporation may be created either by prescription, royal charter (see CHARTER), or by legislative act. It is said to be created by prescription when it has exercised corporate powers for an indefinite period without interference on the part of the sovereign power. By a fiction of law it is then presumed to have had a charter. The method of creating corporations by royal charter was formerly in use in the U. S. as a branch of the English law. Of course the leading mode of creation is an act of the Legislature. It is not necessary that each institution should receive a distinct and separate organization. There may be a general formula provided by the Legislature with which any particular body of men desiring to become a corporation may comply, and thus become incorporated. In other words, corporations may be created under general laws as well as organized under special acts. It may be added that the Legislature may act indirectly as well as directly. It may confer upon some intermediate authority the power to incorporate. In this way in New York an organization known as "The Regents of the University, etc.," has the power under certain conditions to incorporate colleges and academies. To the existence of a private corporation the consent of the members is necessary. This consent may be shown either by an express act of acceptance, or by implication from the exercise of powers under the charter, technically called "user." It should have a name whereby to act or to contract, which may be from time to time changed either by special legislative act or by general law.

III. A corporation, being by fiction of law a person, may have the power to make contracts and to do most other acts possessed by natural persons. In general, however, it has capacity to do such acts as are necessary and convenient to carry forward the special ends for which it was created. At the present time it is usually formed to accomplish a definite object, and it is reasonable that it should have the authority necessary to achieve it. A corporation, like a natural person, may transgress the rules prescribed by law for its action. This fact has caused many perplexing questions to arise as to the effect of an unauthorized act. This subject is known as the doctrine of *ultra vires*—transgression of power. In such a case the better opinion would seem to be that the corporate act, considered as a contract, would be void, though the corporation might be liable to an individual injured by its negligent mode of performing an act which it had no legal authority to undertake. The ordinary powers of a corporation are to make such contracts as are necessary to the accomplishment of its purposes, to hold and acquire property, both personal and real, to have a common seal, to make by-laws for the government of its members or of others, and to elect new members or officers in the place of such as may resign, die, or be removed. The act of removing a member is termed *disfranchisement*; the same act exercised toward an officer is called *amotion*. From early times in Great Britain there have been statutes termed "mortmain acts" (see MORTMAIN) to restrain corporations from acquiring lands without license from the king. Such statutes do not, in general, exist in the U. S. The common practice is to limit in the specific act of incorporation the value of the land which may be acquired. If this restriction be exceeded, the title is still valid, unless the State intervenes and institutes proceedings for a forfeiture. It is a general rule that a corporation can not acquire land by will except for charitable purposes. It is not uncommon, even in that case, for a State statute to limit the amount which a testator may bestow, or to require that the will shall be made a certain time before his death. A corporation may, like a natural person, act through agents beyond the limits of the State where it is organized, unless restrained by law. It should be added that a corporation may commit a wrong for which it will be liable in damages, such as an act of negligence, publication of a libel, etc. It can not, in general, commit a crime, except as resulting from a failure to perform a duty prescribed by law. In order to enforce its rights and to subject itself to its legal duties it may sue and be sued at home or abroad, although a proceeding *against* a non-resident corporation would in general be confined to the property within the jurisdiction. Corporations sometimes are made trustees for estates, guardians for minors, etc. In such a case they would be held accountable in a court of equity in the same way as other trustees or guardians.

IV. By "visitation" is meant the power of superintending the corporation and controlling its action. The subject is peculiarly applicable to the management of charitable corporations. The common law distinguishes between a founder of such a corporation, who supplies the funds for its practical working, and the sovereign power which gives it legal existence. The founder in the first sense is allowed to provide rules for the government and discipline of the college or other institution which he has established, and to designate some person or persons (visitors) who shall see that the rules are properly observed. The exercise of this power of visitation is summary, and without review by the courts of justice, except in extreme cases. This power in the U. S. is rarely lodged in a single person, as it frequently is in England, but boards of trustees are intrusted with it. This doctrine does not prevent a court of equity from controlling the funds on the theory of a trust, so as to prevent waste, mismanagement, or perversion from the purposes intended by the donors. In this aspect a corporation is to be regarded as a trustee. The attorney-general, representing the State, may apply to the court to correct abuses in the management of funds which are in the eye of the law directed to public uses. When the case is sufficiently grave the charter of the corporation may be forfeited.

V. A corporation may be dissolved either by compulsory legislation, by surrender of its franchises, coupled with acceptance of it by the state, and by judicial decree. In England an act of Parliament is boundless in its operation, and a corporation may be arbitrarily dissolved by law. In the U. S. a distinction has been taken between private and public corporations. As has been already seen, a charter of a private corporation is a contract, and as under the U. S. Constitution no State can pass a law impairing the obligation of contracts, the power of the State Legislature can not be exercised so as to materially change the provisions of the charter without the consent of the corporators. (*Dartmouth College* vs. *Woodward*, 4 Wheaton.) The effect of this decision is evaded in a number of the States by the insertion of a clause, either in the charter or some general law, or even in the State constitution, providing that corporate charters are to be held subject to alteration or repeal. This clause is of course valid as to all charters granted subsequently. The most common mode of dissolving a corporation is by judicial decree. Every franchise is accepted on the implied condition that it shall be properly exercised. If there be abuse or neglect to make use of corporate powers, a proceeding may be instituted in behalf of the State to forfeit the charter. The abuse or neglect does not *of itself* destroy the charter, nor can the cause of forfeiture be presented to a court in an indirect manner. For example, it could not be urged by a debtor as creating an incapacity to sue, or by an heir as an incapacity to take an estate by will. A proceeding must be resorted to for the very purpose of forfeiting the charter. State laws sometimes provide dissolution as a mode of enforcing the collection of debts, the property being regarded as a trust fund for that purpose, and a court of equity will administer it for the benefit of creditors. The U. S. statutes of bankruptcy are extended to business corporations. It was an old rule of the common law that a dissolution of the corporation extinguished its debts. Its claims could be no longer collected. Its personal property passed to the State, and its land reverted to the grantor. At present there is little room for the application of these rules. A court of equity would, in general, fasten a trust upon the property in favor of creditors, and in all business corporations for the stockholders. Charitable funds would be administered by other trustees.

For further information consult the works of Grant, Angell, Ames, Abbott, Kyd, Dillon Kent, Merewether and Stephens, and Redfield; also the articles MUNICIPAL CORPORATIONS, etc.

T. W. DWIGHT.

Corps d'Armée (Fr., pronounced kōr'daăr'mā'), or **Army-corps**: one of the primary subdivisions of an army, consisting of two or more "divisions," and containing usually between 20,000 and 30,000 men when on a full war footing. In most European armies the corps is made up of two divisions of infantry and a varying force of cavalry and artillery.

The typical organization of a German corps, from which, however, marked variations exist, is

Two divisions of infantry.....	24,000 men.
Two regiments of cavalry.....	1,200 "
Eight batteries of divisional artillery....	48 guns.
Six batteries of corps artillery.....	36 "

Two companies of pioneers, ambulances, and train.

Some divisions contain no infantry, but are composed entirely of cavalry and horse artillery.

The corps of the Army of the Potomac consisted of four or five divisions of infantry, varying amounts of artillery, and usually enough cavalry for scouting duty only.

The "cavalry corps" was made up of three divisions of cavalry containing thirty-two regiments, to which was attached a brigade of horse artillery of eight batteries. See ARMY, WAR, etc. JAMES MERCUR.

Corps Législatif, kōr'lā'zhĕs'la-teef' (or *legislative body*): the name of the lower house of the French legislature during the second empire. It was established in 1852, and abolished in 1870. The deputies were elected by universal suffrage for a term of six years.

Corpulency: See OBESITY.

Cor'pus Catholico'rum and **Cor'pus Evangelico'rum**: names given after the peace of Westphalia to the Catholic and Protestant divisions of the German empire. The Elector of Mayence was the head of the Catholics, while the lead of the Protestant confederacy belonged successively to the rulers of Saxony, the elector palatine, and Sweden, and was restored to Saxony by the Diet of 1653. Both bodies were dissolved at the separation of the German empire in 1806.

Cor'pus Chris'ti [Lat., body of Christ]: a festival of the Roman Catholic Church celebrated in honor of the Holy Eucharist (which is held by that Church to be really, truly, and substantially the body and blood of Christ). It was first established by a bull of Urban IV. in 1264, and is observed on the Thursday after Trinity Sunday. J. J. K.

Corpus Christi: city; capital of Nueces co., Tex. (for location of county, see map of Texas, ref. 7–H); situated on a bay of same name and on railway, 8 miles below the mouth of the Nueces river; about 200 miles S. W. from Galveston. It has a fine harbor, and in commercial importance it ranks among the first cities in the State. Pop. (1880) 3,257; (1890) 4,387; (1900) 4,703.

Corpus Christi College: See CAMBRIDGE UNIVERSITY and OXFORD UNIVERSITY.

Corpuscular Philosophy: a name sometimes given to the atomic philosophy of DEMOCRITUS (*q. v.*).

Corpuscular Theory: See LIGHT.

Cor'pus Doctri'næ: certain collections of theological writings which have had especial authority in the German Protestant churches. The chief collection was *Corpus Philippicum* (1560, fol.), containing the Apostolic, Nicean, and Athanasian Creeds, the Confession of Augsburg, Melanchthon's Loci Communes, etc. The strict Lutherans rejected it as leaning toward Crypto-Calvinism; the Elector of Saxony pursued with rigorous measures those who refused to teach it. This, with many other Corpora Doctrinæ, was superseded by the *Formula Concordiæ*. See CONCORD, FORMULA OF.

Cor'pus Ju'ris Canon'ici [Lat., the body of canon law]: a comprehensive name for the original collections of the CANON LAW (*q. v.*), including the *Decretum Gratiani* (1151), the *Decretalia* of Gregory IX. (1234), the *Liber Sextus* (1298), the *Clementine Decretals* (1313), etc. The best edition is that of Richter, Leipzig, 1833–39.

Cor'pus Ju'ris Civi'lis [Lat., body of civil justice]: the body of the Roman or civil law as set forth in the great compilations made by order of JUSTINIAN (*q. v.*), consisting of the Institutes, Code, Pandects, and Novels. The term corpus juris civilis is of comparatively late origin, but was in common use as early as the beginning of the seventeenth century. One of the best editions is that of the Kriegel brothers (Leipzig, 1833–40). Revised by F. STURGES ALLEN.

Corral, POINCIANO: Central American general; b. in Costa Rica about 1810. He went to Nicaragua when a youth, married a relation of President Chamorro, who made him Minister of State (1853), and afterward commander of the forces against Castellon. After Chamorro's death he supported the legitimist government, commanding the army at Managua, and repelling Walker's first raid (June, 1855). In October he submitted to Rivas and Walker, and was appointed Minister of War, but was soon after accused by Walker of corresponding with legitimist leaders for the purpose of arranging an attack on Granada. Corral was tried, found guilty, and by order of Walker was shot at Granada, Nov. 8, 1855. HERBERT H. SMITH.

Correa de Serra, kōr-rā'ăă-dā-ser'răă, JOSÉ FRANCISCO, LL. D.: a Portuguese botanist; b. at Serpa in 1750. He visited the U. S. in 1813, and became Portuguese minister at Washington in 1816. He wrote several treatises on vegetable physiology, but his principal claim to literary fame is his *Colecção de Livros ineditos da Historia Portugueza* (1790–1816, 4 vols.). D. Sept. 11, 1823.

Correggio, kōr-red'jō, ANTONIO ALLEGRI: Italian painter; b. at Correggio, 20 miles E. of Parma, in 1494. He was of the most individual character and had very great technical power, but there is little else in his work than that to command our admiration. He can hardly be attributed to any one of the local Italian schools, but was rather the result of all the strong talent of his time, which was the height of the Italian Renaissance, acting on an imitative nature, gifted with great executive ability. He seems to have had a very early success, and the story of his having died from the fatigue of carrying home a load of copper coin in which he was paid for his work has not the slightest foundation in history. He died young, but before his death had lived in a comparative retirement for several years, and, so far as is known, no longer in the practice of his art. The distinguishing quality in his painting is his large, rapid, and extraordinary brush-work, and his impasto is not surpassed in masterly precision and largeness by that of Titian or Tintoretto. Sir F. W. Burton, keeper of the National Gallery of London, one of the most competent technical critics of our time, says of him: "Taking this great genius by himself, it is difficult to overestimate his powers. But the influence he exercised on later art was more baneful than otherwise." His most important works are the great paintings at Parma, where the dome of the cathedral and that of the Church of St. John the Evangelist were covered with his work, in the one case the ascension of the Madonna, in the other a vision of St. John. In the convent of St. Lodovico, in the same city, is a large work of his youth, covering the vaulting of a large room. His best known and most admired easel pictures are perhaps the *Marriage of Saint Catharine* and the *Jupiter and Antiope*, in the Louvre; the *Nativity of Christ* (called *The Night*), and the small picture of the *Magdalen*, at Dresden; the *Leda*, at Berlin; and the *Venus and Cupid with Mercury*, in the National Gallery in London. D. in Correggio, Mar. 5, 1534. W. J. STILLMAN.

Correlation of Forces, or **Transmutation of Force or Energy**: See ENERGY; DISSIPATION OF ENERGY.

Corrèze, kōr'rez': a department of France near its center; a part of the former province of Limousin. Area, 2,265 sq. miles. It is drained by the rivers Dordogne, Vezère, and Corrèze. The surface is hilly; the soil is mostly poor. The staple productions are grain, timber, coal, copper, lead, iron, and chestnuts. Capital, Tulle. Pop. (1891) 328,119; (1896) 322,393.

Corrien'tes: a province of Argentina; bounded N. by Paraguay, E. by the river Uruguay, separating it from Missiones, Brazil, and Urnguay, S. by the province of Entre Rios, and W. by the river Paraná, separating it from the province of Santa Fé and the territory of Chaco. Area, 48,357 sq. miles. The extreme southeastern portion is hilly; the remainder is a plain, with numerous lakes and swamps. The Laguna Ibera, in the northern part, is a swamp covering about 4,000 sq. miles and flooded annually. The land is generally open and adapted for pasturage, but there are extensive tracts of forest. The climate is semi-tropical. Grazing is the principal industry; oranges are extensively raised for the markets of Buenos Ayres and Montevideo. Capital, Corrientes. Pop. (1895) 239,344. H. H. SMITH.

Corrientes, or **Siete Corrientes**: capital of the province of the same name; on the right bank of the Paraná river, here more than a mile broad, just below the confluence of the Paraguay (see map of South America, ref. 7–E). Corrientes was founded in 1588. The exports are mainly dried meat, hides, and tallow. Pop. (1895) 14,000, and rapidly increasing. H. H. S.

Corrigan, MICHAEL AUGUSTINE, D. D.: Roman Catholic archbishop of the diocese of New York; b. in Newark, N. J., Aug. 13, 1839; educated at St. Mary's College, Wilmington, Del., and at Mt. St. Mary's, Emmetsburg, Md., graduating from the latter institution 1859; ordained to the priesthood at Rome 1863; received the degree of D. D. 1864; president of Seton Hall College, Orange, N. J., 1868–73; appointed by Pius IX. to the see of Newark 1873; made coadjutor to Cardinal McCloskey, Archbishop of New

York, under the title of Archbishop of Petra 1880; on Cardinal McCloskey's death he became metropolitan of the diocese of New York 1885. C. H. THURBER.

Corrodentia: an order of insects. See PSOCIDÆ.

Corrosive Sublimate: See MERCURY.

Corrugated Iron [from Lat. *corruga're*, make wrinkled; *con* + *ru'ga*, wrinkle]: a name applied to iron in thin plates or sheets which are passed between rollers, producing grooves and ridges in the iron. In this manner the strength of the material is greatly increased, while the square surface of the iron is of course reduced. Corrugated iron is of great value in the construction of buildings, especially for roofs, where lightness and strength are to be combined. It is much used for covering the walls of frame buildings, both within and without. It is frequently "galvanized"—i. e. covered with a thin layer of zinc by dipping it in a bath of the fused metal.

Corruption of Blood: See ATTAINDER.

Corrupt Practices Act: See BALLOT REFORM.

Corry: city and railway center; Erie co., Pa. (for location of county, see map of Pennsylvania, ref. 1–A); 37 miles S. E. of Erie; it has churches of eight denominations, a conservatory of music, good schools, numerous large factories making boring-machines, mechanical toys, bedsprings, upholsterings, mattresses, locomotives and cars for lumber companies, oil-well supplies, boilers, electrical plant, boxes, tables, patent medicines, brooms, sashes and blinds; here are also barrels, brushes, stationary engines, etc., blast furnaces, tanneries, brick-works, flour and feed mills, artesian well, electric lights, water-works, and fuel gas-works. The city has a public park; its growth dates from 1860. Pop. (1890) 5,677; (1900) 5,369. EDITOR OF "LEADER."

Cor'sica (anc. *Cyrnos*, afterward *Corsica*; Fr. *La Corse*): island in the Mediterranean; situated between lat. 41° 20′ and 43° N., and lon. 8° 30′ and 9° 30′ E.; 55 miles from Italy and 110 from France. It is separated from Sardinia by the Strait of Bonifacio, 9 miles wide. It is 110 miles long N. and S., and is 53 miles wide at the broadest part. Area, 3,377 sq. miles. The west coast is deeply indented by the Gulfs of Calvi, Porto, Ajaccio, and Valinco. The interior is traversed by a mountain-chain, the highest peaks of which are Monte Cinto (8,889 feet), Rotundo (8,609 feet), Pagli-Orba (8,284 feet), Padro (7,846 feet), and D'Oro (7,841 feet). To the W. and S. this mountain-chain sends forth a great number of rugged spurs, which fall off abruptly toward the sea. They are covered with immense forests of oak, beech, pine, cork, and chestnut trees, from which in olden times the Romans derived most of the timber for their fleets. But the indolence of the present population has left this source of wealth comparatively neglected. To the E. broad plains open between the mountains and the sea, and here are found large plantations of orange, fig, almond, olive, and lemon, and extensive vineyards. But agriculture is in a backward state, and most of the wine produced in Corsica is sent to France in a raw state to be used for liqueurs. The principal industry is the rearing of cattle, horses, asses, and mules. A peculiar breed of black sheep called *mufflons* is raised on the mountain-pastures. The fisheries of tunny and pilchard are extensive. Among the minerals of Corsica are iron, copper, antimony, lead, granite, porphyry, marble, and limestone. The chief towns are Ajaccio, Bastia, and Calvi. There are a few railways on the island. Corsica was first colonized by the Phœnicians, who called it *Cyrnos*, was conquered by the Carthaginians, and by the Romans soon after 237 B. C. The Genoese became masters of it in 1481. It was ceded by the Genoese to France in 1768. Pop. (1896) 290,168. See Boswell, *Account of Corsica* (1768); Merimée, *Colomba* (1841); Borde, *En Corse* (1887); and Bonaparte, *Une Excursion en Corse* (1891).

Corsica'na: city and railway center; capital of Navarro co., Tex. (for location of county, see map of Texas, ref. 3–I). It has State Orphan Asylum, Widows' and Orphans' Home, convent, high school, large cotton compress, roller flour-mill, grain-elevator, machine and repair shops, cotton-gin, bottling and ice factories, brick-yards, two oil-mills, foundry, street railway, and fine system of water-works. Pop. (1870) 80; (1880) 3,373; (1890) 6,285; (1900) 9,313.
EDITOR OF "COURIER."

Cor'so [Ital., race-course: Fr. *cours* < Lat. *cursus*, running, course, deriv. of *cur'rere*, run]: in Italy, a principal street of a large town. The Corso of Rome is famous as the scene of the diversions of the carnival.

Cor'son, HIRAM: scholar; b. in Philadelphia in 1828; became a teacher, and was (1849–53) connected with the Library of Congress and that of the Smithsonian Institution. He was Professor of History and Rhetoric in Girard College 1865–66, and in St. John's College, Annapolis, Md., 1866–70, when he became Professor of English Language and Literature, etc., in Cornell University. He published Chaucer's *Legende of Goode Women*; *Handbook of Anglo-Saxon and Early English*; *Introduction to the Study of Browning*; *Primer of English Verse*, etc., and prepared a *Thesaurus of Early English*.

Cors'sen, WILLIAM PAUL: German philologist and antiquary; b. in Bremen, Jan. 20, 1820; for several years professor at the gymnasium at Stettin, and subsequently at the Landesschule at Pforta until 1866, when he resigned on account of his health. Author of a learned and once highly esteemed work on *The Pronunciation, Vocalism, and Accentuation of the Latin Language* (2 vols., 1858–59; 2d ed. 1867–69), still valuable as a collection of material. He also published a once famous work on the *Etruscans*, now quite antiquated. D. June 18, 1875. Revised by ALFRED GUDEMAN.

Cort, CORNELIUS: engraver; b. in Horn, Holland, in 1536; a disciple of Jerome Cock. He wished to interpret in engraving the color of paintings, and with this aim went to Italy, sojourning at Venice for some time. Titian received him in his house, and he in recognition of this favor engraved many of Titian's works, especially landscapes. Cort then went to Rome. His finest works are *The Martyrdom of S. Laurence* of Tintoret and *The Transfiguration* of Raphael. D. in Rome in 1578.

Cor'tes [plu. of Sp. *corte*, a court]: the national assembly or legislature of Spain; also that of Portugal. See LEGISLATURES.

Cortés, HERNANDO, HERNAN, or FERNANDO: conqueror of Mexico; b. at Medellin, in Estremadura, Spain, in 1485. He studied law at the University of Salamanca, and sailed to the New World to seek his fortune in 1504. He served with distinction under Velasquez in the conquest of Cuba in 1511, after which he married Catalina Juarez, and became the owner of an estate in Cuba. In 1518 he was appointed by Velasquez to conduct an expedition against Mexico, which had recently been discovered. He sailed from Cuba with eleven vessels and about 700 men in Feb., 1519; defeated an army of the natives at Tabasco, and landed on the site of Vera Cruz, where he destroyed his ships, to induce his men to fight with more desperate courage when they knew that it was impossible to save themselves by retreat. He learned that he had entered the extensive empire of Montezuma, who reigned over Anahuac and possessed immense treasures of gold and silver. In Aug., 1519, he left the seacoast and marched against Mexico or Tenochtitlan, the capital of Anahuac. Passing through the independent state of Tlascala he was resisted by the natives, whom he defeated in several battles; continuing his way, he entered Mexico without resistance in Nov., 1519, and was received with friendly demonstrations by Montezuma. The audacious Spaniard seized Montezuma in his own palace, kept him as a prisoner, and extorted from him a large quantity of gold. The captive prince was persuaded or forced to swear allegiance to Charles V., but he refused to adopt the religion of the Spaniards. Meanwhile, Velasquez discovered that Cortés had thrown off his authority; he therefore sent Narvaez with about 1,000 men to supersede him, or operate against him in case he should not submit. Leaving a part of his force at Mexico, Cortés marched with 250 men to encounter Narvaez, whom he defeated and took prisoner at Zempoalla in 1520. Having persuaded the soldiers of Narvaez to enlist in his service, he returned to Mexico, the people of which had revolted against the Spaniards during his absence. In the fight, which continued several days, Montezuma was killed by his own subjects, and the Spaniards were driven out of the city. Cortés gained a victory at Otumba in July, 1520, and took Mexico after a memorable siege, in 1521. In 1522 the King of Spain appointed him governor and captain-general of the conquered country, called New Spain. Cortés went to Spain in 1528, in order to vindicate himself against accusations made by his enemies, and was received with favor at court. He returned to Mexico in 1530, but he retained only the command of the army, the civil administration having been placed in the hands of a viceroy. This division of power gave rise to much haggling and jealousy. Cortés felt himself hampered in his activity, and in 1540 he once more returned to Spain.

But this time he was coldly received by Charles V. He accompanied the emperor in the unlucky campaign in Algeria, spent the rest of his life in obscurity, and died near Seville, Dec. 2, 1547. Five letters which he addressed to the emperor on the subject of his conquest are still extant. They have been printed in *Historia de Nueva España*, by Lorenzana (Mexico, 1770), and have been translated into English by George Folsom (New York, 1843). See Prescott, *Conquest of Mexico*; Helps, *Life of Cortez* (1871); and Bancroft, *History of the Pacific States* (*Mexico*), vols. i. and ii.

Revised by H. H. Smith.

Cortés, José Domingo: Chilian author; b. about 1830. He was variously employed as a journalist, as *attaché* of the Chilian legation at Brussels, and in Bolivia as director-general of libraries. He published a large number of biographical and historical works, among them the *Diccionario biografico Americano*, *Historia de Bolivia*, *Estadistica bibliografica de Bolivia*, *Los Revolucionarios de la independencia de Chile*, *Poetas Americanos*, and *República de Mejico*. He also edited a general collection of the works of Latin-American authors. D. in 1884. H. H. S.

Cortés, Martin: illegitimate son of the conqueror by the Indian Marina; b. in Mexico about 1521. He was taken to Spain in 1528, was legally recognized by his father, made a knight of Santiago, and served as a soldier in Algiers and Germany. He returned to Mexico with his brother and namesake, the Marques del Valle, in 1562; was arrested in July, 1566, on suspicion of being concerned in the alleged plot of the Avilas, and during eighteen days was subjected to torture, but continued to declare his innocence. In the end he was sentenced to be exiled for life and to pay a fine. It is believed that this sentence was never carried out, for in 1568 he was still living in Mexico, where he probably remained until his death. Herbert H. Smith.

Cortés, Martin: legitimate son of Hernando Cortés; b. in Mexico in 1532. His father took him to Spain in 1540; he received a liberal education, and inherited the title of Marques del Valle. A great portion of the Mexican estates would have been lost to him by a decision of the Council of the Indies, but they were restored by Philip II., with whom he seems to have been a favorite. He accompanied that monarch to Flanders and to England at the time of the marriage with Mary; served with distinction in the army, and was at the battle of St.-Quentin; and, on his return from the Flanders campaign, married Doña Ana Ramirez de Arellano, his niece. In 1562 he went to Mexico, where he lived in great splendor, and had much influence, though not directly concerned in the government. Owing to discontent respecting the new laws of *encomiendas*, the brothers Avila, Aguilar, and others are said to have formed a plan to murder the judges of the audience and make the Marques del Valle sovereign of Mexico. It does not appear that this plot was ever definitely decided upon, and it seems certain that the marquis never treated it seriously; but on July 16, 1566, he was arrested, as were Alonzo de Avila and his brother. The latter were executed, and the marquis was sent to Spain, his estates being sequestered. After several years they were restored to him. D. in Spain, Aug. 13, 1589. The direct line of Cortés ended with the fourth marquis, Pedro, in 1628. The title eventually passed to the Dukes of Terranovo and Monteleone, one of the proudest families of Italy. The estates have passed through many vicissitudes, and have several times been sequestered; but a large portion is now in the possession of the heirs of Cortés.

Herbert H. Smith.

Corthell, Elmer Lawrence: civil engineer; b. at South Abington, Mass., in 1840; educated at Brown University, Providence, R. I.; served in artillery in Union army during civil war, becoming captain of a light battery; studied engineering; from 1868–74 in charge of important work in the Western U. S., including railways in Illinois and Missouri, bridges over the Mississippi at Hannibal and Louisiana, Mo., and the Sny island levee in Illinois; associated with James B. Eads in constructing jetties at mouth of Mississippi river. He accompanied Eads to Mexico, and made surveys for a ship-railway across the isthmus at Tehuantepec; from 1881 to 1885 chief engineer constructing the New York, West Shore and Buffalo R. R.; at same time chief engineer of the ship-railway in Mexico, conducting surveys and plans of the work; after the death of Eads he removed to Chicago, opening an office there and also in New York; constructed large bridges in different parts of the U. S., including that at Cairo, Ill., the longest steel structure in the world, and the Merchants bridge at St. Louis; in 1889 chief engineer of jetties at mouth of Brazos river, Texas, also at Tampico, Mexico, of Tehuantepec ship-railway and the Ontario ship-railway. In 1888 he was vice-president of the American Society of Civil Engineers; in 1889 president of the Western Society of Engineers; chairman of the general committee which organized and conducted the International Engineering Congress, Chicago, 1893. Author of *A History of the Jetties at the Mouth of the Mississippi River* (New York, 1880).

Cortland: village and railway junction; capital of Cortland co., N. Y. (for location of county, see map of New York, ref. 5–G); on the Tioughnioga river; 36 miles S. of Syracuse. It has a State normal school, electric lights, waterworks, and street railway. Pop. (1880) 4,050; (1890) 8,590; (1900) 9,014. Editor of "Standard."

Cortona, Pietro, di: painter; b. Nov. 1, 1596; went to Rome in poor circumstances. The Marchese Sacchetti, seeing him painting in the shop of a gilder, undertook his maintenance and placed him in the art-school of Baccio Carpi. He acquired his drawing from ancient bas-reliefs and the art of grouping figures from Lanfranco. *The Rape of the Sabines* and *The Battle of Alexander* were the first works which made him noticeable. On the strength of their success Urban VIII. chose him to paint a chapel at Bibiana. A little after he decorated the great reception-room for the Barberinis; this is one of his finest works. He spent some years in Florence, painting for Ferdinand II. several rooms in the Pitti Palace. His great success in the execution of this work attracted the envy of many of his imitators. He was accused of having sold to the grand duke, as originals, certain copies after Titian; this brought him into disfavor, and he left Florence in dudgeon, never to return there. He then lived in Rome, where he continued to paint remarkable works. When unable to mount on a scaffold, being much afflicted by gout in his later years, he painted easel pictures, which are rare. D. in Rome, May 16, 1669. W. J. Stillman.

Corumbá: city of the state of Matto Grosso, Brazil, on the west side of the river Paraguay, in 18° 59′ 38″ S. lat. It was a mere hamlet until the opening of the Paraguay to steam navigation in 1856; it then became the port of entry for Matto Grosso, the entire commerce of this vast region passing through it. Pop. about 5,000. From July 3, 1865, to June 13, 1867, it was held by the Paraguayans. Besides its river trade, Corumbá has a considerable commerce with Bolivia. Three miles below the city, at Ladario, is one of the principal marine arsenals of Brazil, with a strong fort.

Herbert H. Smith.

Corun'dum: a mineral consisting, when pure, of native oxide of aluminium, which is, however, almost invariably mixed with magnetic oxide of iron. It occurs crystallized, massive, granular, in impalpable powder, and in layers. Mineralogically, corundum is divided into three varieties: (1) Sapphire, which includes the purer kinds, as sapphire, ruby, Oriental topaz, salamstone, Oriental amethyst, etc.; (2) corundum proper, the duller kinds crystallized or semi-crystalline, including adamantine spar; and (3) emery, the darker and coarser kinds.

The specific gravity of corundum is about 4, while in hardness it is next to the diamond. It becomes strongly electrical by friction. Its crystalline form is rhombohedral. The ruby or red sapphire is valued next to the diamond, and beyond a certain size (3½ carats) as equal to it in value. Its color is supposed to be due to chromic acid, but the amount of coloring-matter is so small that it eludes the ordinary tests. The crystals are seldom above half an inch in length. Two crystals an inch in diameter and about 2 inches long are said to have been in the possession of the former King Thebaw of Burma. The largest ruby known came from China, and, after having been in the possession of Prince Mentzikoff, was finally made one of the jewels of the Russian crown. The largest rubies come from the Capelan Mountains, Ava. Smaller ones are found in Saxony and Bohemia, and occasionally in other localities in Europe; also in the U. S. The blue sapphire occurs much larger, crystals 3 inches in length being sometimes found. The crystals sometimes exhibit a radiated interior with a play of colors, when it is known as asteria or asteriated sapphire. Sapphires are obtained in Ceylon, India, and China, principally in the first-named country. Fine specimens are often found in the beds of streams, whither they have been carried after the decomposition of the rock originally inclosing them. The light-blue sapphires are often exposed to fire by lapidaries to ren-

der them more brilliant. With those from Epailly in France heating deepens the color. White sapphires are sometimes cut and passed for diamonds, which they much resemble. The Brazil sapphire is a blue tournaline.

The Greek *σάπφειρος*, from which the name was derived, was, according to Dana, not what at the present day is called sapphire, but the stone now known as lapis-lazuli. Rubies and sapphires contain about 1 per cent. of magnetic oxide of iron.

Adamantine spar occurs in brownish crystals. It was used by the ancients as a polishing material, and continues to be used for fine work. The chief supplies are brought from China and the Ural Mountains. Salaustone occurs in pale reddish or bluish transparent crystals. Corundum is found abundantly in Chester co., Pa. See EMERY.

Revised by C. KIRCHHOFF.

Corun'na: a province of Northwestern Spain, forming the N. W. part of Galicia, having the ocean W. and N., Lugo E., and Pontavedra S. It has fine forests and pastures and arable lands, besides iron mines. Area, 3,079 sq. miles. Capital, Corunna. Pop. (1887) 613,792.

Corunna (anc. *Adrobicum*; Sp. *Coruña*): fortified city and seaport of Spain; capital of the province of same name; on the Atlantic Ocean; 320 miles N. W. of Madrid; lat. 43° 22′ N., lon. 8° 24′ W. (see map of Spain, ref. 12–B). It has a safe harbor defended by two forts, and a lighthouse, which is called the Tower of Hercules, and is 92 feet high. It has a citadel, court-house, custom-house, arsenal, theater, and the palace of the captain-general. Here are manufactures of linen and hats, cordage, canvas, and cigars. On Jan. 16, 1809, a battle occurred here between the French marshal Soult and the British general Sir John Moore, who was killed. Pop. (1887) 36,200.

Corunna: city; capital of Shiawassee co., Mich. (for location of county, see map of Michigan, ref. 7–J); on railroad and on the Shiawassee river; 75 miles N. W. of Detroit; has churches, public school, flouring-mill, woolen-mill, bituminous coal mine, inexhaustible supply of sandstone, women's library. Pop. (1880) 1,501; (1890) 1,382; (1900) 1,510.

EDITOR OF "INDEPENDENT."

Corval'lis: city; on railway; capital of Benton co., Ore. (for location of county, see map of Oregon, ref. 3–B); situated on Willamette river; 100 miles S. of Portland; contains the State Agricultural College, a handsome county court-house, city-hall, 2 public schools, 3 large saw and planing mills, 2 flour-mills, a carriage factory, and the general office of the Oregon Pacific R. R.; is surrounded by a rich agricultural country, which is very healthful. Steamboats visit the town during two-thirds of the year. The principal export is wheat. Pop. (1888) 1,128; (1890) 1,527; (1900) 1,819.

EDITOR OF "CORVALLIS TIMES."

Corvée: in feudal law, the obligation of the inhabitants of a district to perform certain services for the sovereign or feudal lord, such as the repair of the highways. Some of these services were performed gratis, others for wages below the value of the labor.

Revised by F. STURGES ALLEN.

Corvette, kōr-vet' [Fr., cogn. with Span. *corbeta*: Portug. *corveta* < Lat. *corbi'ta*, a transport ship, deriv. of *cor'bis*, basket]: a small vessel of war having three masts, flush decks, and one tier of guns on the upper deck. The masts are square-rigged.

Corvey: a Benedictine abbey on the Weser, about 30 miles N. by E. of Paderborn, Westphalia, Prussia; a colony from the monastery of Corbie, in the diocese of Amiens, France, founded in 822 by Adalhard, the abbot of Corbie. The first place selected for the colony was at Hethi, in the Solinger Forest, near the present city of Uslar; proved unfavorable, and after seven years of labor lost the colony had to be removed to Huxori, near the present Höxter. But there it prospered so well that ere long it completely outshone the mother institution. After Adalhard's death it obtained its own abbot and became independent of Corbie, and during the latter part of the ninth century large endowments poured in upon it. In 836 the remains of St. Vitus was transferred thither from the abbey of St. Denis, and the relics greatly increased the fame of the monastery. During the earliest period of its history it was the center of the Saxon and Scandinavian missions; Ansgar, Rimbert, Autbert, Nithard, etc., issued from its cells. Later on it became the center of learning in Germany. It had an excellent library, in which in 1514 the lost first five books of the *Annals of Tacitus* were discovered. It maintained at one time twenty-four professors. Not only was theology taught in its schools, but also the sciences. During the Thirty Years' war (in 1632) the monastery was plundered and burnt, and its valuable books and other treasures were hopelessly destroyed or scattered. Its landed property was also confiscated, and little was restored at the Peace of Westphalia. Its princely rank was taken from it, and its prince-abbot became bishop of the little diocese made out of the abbey lands (1792). In 1821 the diocese was joined to that of Paderborn. So all trace of the ancient foundation has well-nigh been lost. At present the building belongs to the Duke of Ratibor, who is also Prince of Corvey. See Paul Wigand's *Geschichte Corveys* (Höxter, 1819); is unfinished, only extends to 1146, and unreliable because derived from the corrupted *Annales Corbeienses*.

Revised by S. M. JACKSON.

Corvi'nus (MATTHIAS) **I.**: King of Hungary; a son of John Huniades; b. at Klausenburg in 1443. He was elected king in 1458. He waged war against the Emperor Ferdinand III., the Turkish sultan, and the King of Poland. In 1485 he captured Vienna. He had superior military talents and was an able ruler. D. Apr. 7, 1490. See Wenzel, *Matthias Corvinus* (1810).

Cor'vus, M. VALERIUS: a famous Roman general; b. about 370 B. C.; was elected consul in 348. He defeated the Samnites in 343, and was chosen dictator in 342 and in 301 B. C. In the year 299 he was elected consul for the sixth time. D. about 270 B. C.

Corwin, EDWARD TANJORE, D. D.: clergyman; b. in New York city, July 12, 1834; graduated at the College of the City of New York, 1853, and at the Theological Seminary at New Brunswick, 1856. He was pastor in Paramus, N. J., 1857–63, and in Millstone 1863–88, at which date he became rector of Hertzog Hall, New Brunswick. He has published *Manual and Record of Church of Paramus, N. J.* (1858); *Manual of Reformed Protestant Dutch Church* (1859); *Centennial of Reformed Dutch Church, Millstone, N. J.* (1866); *Manual of Reformed Church in America* (1869; enlarged edition 1879); *Corwin Genealogy* (1872). Besides these, he has published sermons and articles, and was editor in part of the *Centennial Discourses* (1876; second edition 1877); and of the centennial volume of the New Brunswick Seminary, published in 1884.

WILLIS J. BEECHER.

Corwin, THOMAS: statesman and orator; b. in Bourbon co., Ky., July 29, 1794; removed to Ohio in early youth, and studied law, which he practiced with distinction. He was elected a member of Congress in 1830, joined the Whig party, and advocated the election of Gen. Harrison in 1840 by effective public speeches. In the same year he was chosen Governor of Ohio. He was elected to the Senate of the U. S. in 1845, and was appointed Secretary of the Treasury by President Fillmore in July, 1850. In 1858 he was chosen a member of Congress, and in 1860 was re-elected. He was sent as minister to Mexico in 1861, returned home in 1864, and died Dec. 18, 1865. See the *Life and Speeches*, edited by Strohn (Dayton, O., 1859).

Coryat, THOMAS: English traveler and humorist; b. in 1577. He went on foot over a great part of Europe, and gave an amusing account of his peregrinations in his very eccentric book, *Coryat's Crudities* (1611). He wrote several other narratives of travel, and died at Surat in 1617 after rambles through Greece, Asia, Egypt, and India.

H. A. B.

Coryban'tes [Gr. *Κορύβαντες*, the plural of *Κορύβας*]: Phrygian priests of Cybele or Rhea. They were distinct from the Galli, who were Roman eunuchs and priests of the same goddess. They celebrated the festivals of Cybele with orgiastic dances and loud cries, beating on timbrels, and cutting their flesh with knives.

Corydon: capital of Harrison co., Ind. (for location of county, see map of Indiana, ref. 11–E); on railroad and Indian creek; 115 miles S. of Indianapolis; has a furniture-factory, two flour-mills, and an academy. It is a handsome place, has a sulphur spring, and is a summer resort. It was the capital of the State until 1824. Pop. (1880) 763; (1890) 880; (1900) 1610.

Corydon: capital of Wayne co., Ia. (for location of county, see map of Iowa, ref. 7–G); situated on railroad; about 65 miles S. by E. from Des Moines. Pop. (1880) 801; (1890) 962; (1900) 1,477.

Cor'ylus: See HAZLENUT.

Cor'ymb [from Gr. *κόρυμβος*, uppermost point, head; cf. *κόρυς*, helm]: in botany, a form of inflorescence consisting of a central axis and lateral pedicels, of which the lower are longer than the upper, and the lengths of the pedicels are so graduated that the flowers are all on the same level, as in the *Spiræ*, *Kalmia*, and *Cratægus* (hawthorn).

Cor'ypha [Gr. *κορυφή*, tip, summit]: a genus of tropical fan-leaved palms, one of which, the *Corypha umbraculifera*, or talipot palm, grows in Ceylon to the height of 60 or 70 feet, and bears circular leaves often 12 feet in diameter.

Coryphæ'us, or **Corypheus** (in Gr. *κορυφαῖος*): the leader of the chorus in ancient classical dramas, by whom the dialogue between the chorus and the other actors of the drama was carried on, and who led in the choric song. The name is metaphorically applied to any great leader: thus Dr. Samuel Johnson is sometimes called "the coryphæus of English literature."

Coryph'odon [from Gr. *κορυφή*, tip, summit + *ὀδούς*, *-όντος*, tooth]: an extinct genus of ungulate mammals from the lowest Eocene of Europe and America. The skull in this genus presents many perissodactyl features. It is elongated in the facial region, and the nasal opening is large. The dental formula is—incisors, $\frac{3}{3}$; canines, $\frac{1}{1}$; premolars, $\frac{4}{4}$; molars, $\frac{3}{3} \times 2 = 44$. The brain cavity is quite small, as in all Eocene mammals, and indicates that the brain itself was of a very inferior type. Its most striking features were the small size of the hemispheres and the large expanded cerebellum. The limbs were short, and the femur had a third trochanter. The feet are especially interesting, as they present a primitive or generalized type, having five toes both before and behind. The first known species was described by Prof. Owen under the name *C. eocenus*, and was from the London clay. *C. oweni* is from the lowest Eocene of France. *C. hamatus*, the best-known American species, is from the base of the Eocene in Wyoming, and other species occur in the lowest Eocene of Utah and New Mexico. The genus is thus of great importance, as indicating the parallelism of European and American strata. The animals were about the size of the tapir. O. C. Marsh.

Coryza: See Catarrh.

Cos, or **Kos** (Gr. Κῶς), called also **Stan'chio**, stăn'kĕe-ō: an island of Asiatic Turkey; in the Mediterranean; separated from the coast of ancient Caria by a channel about 3 miles wide. It was called *Lango* in the time of the Knights of Rhodes. It is nearly 22 miles long and 5 miles wide. Area, 85 sq. miles. The surface is partly hilly, the soil is fertile, and the climate delightful. Among the products are cotton, silk, wine, and fruits. In ancient times it contained a celebrated temple of Æsculapius, and was the native place of Hippocrates, Apelles the great painter, and Ariston the philosopher. Pop. 20,000, mostly Greeks. Cos is also the name of a seaport-town on this island. Its port is visited by many merchant-vessels. Pop. about 8,000. See also Coos.

Cosa, Juan, de la: Spanish navigator; b. about 1460. He accompanied Columbus in 1493 to Hispaniola and Cuba. In 1496 he was living at Santona, and had acquired a great reputation as a pilot and chart-maker. He next appears as pilot in the expedition of Ojeda to the Pearl coast, May, 1499, to June, 1500. In Oct., 1501, he sailed again with Bastidas, exploring the northern coast of South America from Venezuela to the Isthmus of Panama. On his return in 1502 he reported that Portuguese ships had been seen on those coasts. He was sent on a mission of remonstrance to Lisbon, where he was imprisoned until Aug., 1504. He subsequently made two successful voyages to the northern coast of South America in command of small fleets (1504–06 and 1507–08). In the latter year he was appointed *alguazil mayor* of Uruba, and in that capacity he accompanied the expedition of Ojeda, destined to settle there. Ojeda, contrary to his advice, landed at the bay of Cartagena with part of his force, including La Cosa. Attacked by Indians, all were slain except Ojeda (Nov., 1509). Two or three of La Cosa's charts have come down to us. His map of the New World is the earliest known, having been made in 1500. It is on vellum and beautifully illuminated. Humboldt found it in 1832 in the library of Baron Walckenaer, and in 1853 it was bought by the Spanish Government.
Herbert H. Smith.

Cosegüina, kō-sā-goo-ee'-nă, or **Cosigüina**: a volcano of Nicaragua; occupying a peninsula at the extreme northwest corner of the republic, between the Pacific and the Gulf of Fonseca. It is 3,835 feet high, and appears simply as a barren cone, much less prominent than many other Central American mountains; but it is notable for one of the greatest volcanic outbursts on record. Early in January, 1835, it gave signs of activity, and on the 20th of that month an enormous mass of ashes burst from its summit; the eruption continued for three days, accompanied by explosions which were heard as far as Oajaca, Mexico; the country for 100 miles around was darkened by the cloud, the obscurity in many places being like that of the thickest night; ashes fell thickly over a large part of Central America, and were carried by the wind to Jamaica and Mexico. Cosegüina at present is quiescent or extinct. H. H. Smith.

Cosen'za: a province of Italy; bounded N. by Basilicata, S. by Catanzaro, and E. and W. by the sea. It is mountainous, and produces rice, saffron, honey, oil, and wine. Its fisheries are still important, though they are not utilized with the same energy as in former days. Capital, Cosenza. It was formerly named Calabria Citeriore. Area, 2,840 sq. miles. Pop. (1890) 463,181.

Cosenza (anc. *Consentia*): a city of Italy; capital of the province of Cosenza; at the confluence of the rivers Crati and Busento; 12 miles E. of the Mediterranean and 262 S. E. of Naples by rail (see map of Italy, ref. 8–G). It is the seat of an archbishop, and contains a fine court-house, a cathedral, a royal college, a theater, several convents, and an old castle which has been converted into barracks. It has manufactures of cutlery and earthenware, and an active trade in silk, oil, wine, manna, rice, etc. Consentia was the ancient capital of the *Brutii*. Pop. 12,590.

Coshoc'ton: village and railway junction; capital of Coshocton co., O. (for location of county, see map of Ohio, ref. 4–G); on the Muskingum river just below the junction of the Tuscarawas and Walhonding; on the Ohio Canal; 69 miles E. N. E. of Columbus. A bridge across the river connects it with Roscoe. Coshocton has 6 churches, 4 schools, steel-works for axles, a paper-mill, and 2 large novelty-advertising concerns. Pop. (1880) 3,044; (1890) 3,672; (1900) 6,473. Editor of "Age."

Cosin, John: English prelate; b. in Norwich, Nov. 30, 1594; educated at Cambridge; by command of Charles I. prepared a manual of *Private Devotions* (1627); became master of St. Peter's College, Cambridge, in 1634; and in 1640 Dean of Peterborough and vice-chancellor of the university; after holding services in Paris during the Commonwealth was made Bishop of Durham in 1660. Author of *Scholastical History of the Canon of Holy Scripture* (1657); *History of Popish Transubstantiation* (1675). D. Jan. 15, 1672. C. H. T.

Cosmati, kos-maa'tĕe, **The** (Lorenzo and his sons, Luca and Jacopo Cosma): architects and mosaic-workers of high distinction in the first half of the thirteenth century, whose work at Civita Castellana, Falleri, and at the Villa Mattei, Rome, shows that the arts were not lost even there when Cimabue flourished. They form a link between the Roman art of the tenth and eleventh centuries and the general Renaissance in Italy. W. J. Stillman.

Cosmic Dust: See Dust.

Cosmo de' Medici: See Medici.

Cosmogony [from Gr. *κοσμογονία*, origin or development of the universe, a word constructed on the type of *θεογονία*, theogony; *κόσμος*, universe + *-γονία*, deriv. of root *gen-*, become, in *γονή*, etc.]: the science or theory which treats of the origin of the cosmos or universe. If we except the cosmogony of the East Indians, the earliest extant is that of Hesiod, which is delivered in hexameter verse. The first prose cosmogonies were those of the early Ionic philosophers, of whom Thales, Anaximenes, Anaximander, and Anaxagoras are the most celebrated. In modern times a *Theory of the World* has been produced by Burnet. The different theories of the origin of the world may be comprehended under three classes: 1. Those which suppose the world to have existed from eternity under its actual form. Aristotle held this doctrine, and, conceiving the universe to be the eternal effect of an eternal cause, maintained that not only the heavens and the earth, but all animate and inanimate beings, are without beginning. 2. Those which consider the matter of the universe eternal, but not its form. This was the system of Epicurus and most of the ancient philosophers and poets, who imagined the world either to be produced by the fortuitous concourse of atoms existing from all eternity, or to have sprung out of the chaotic form which preceded its present state. 3. Those which ascribe

both its matter and its form to the direct agency of a spiritual cause.

The account given in Genesis of the creation is obviously not a scientific cosmogony, which would not only have been out of place in a divine revelation intended specially to impart religious truth, but would, if given in a scientific form (since science is constantly progressing and therefore changing), have been adapted to a single age or period only. Or, supposing the highest and *ultimate* facts of science had been given, it would have been so far in advance of all scientific thought yet reached, or that will be reached perhaps for fifty thousand years to come, that it would be wholly unintelligible, and would in all probability appear utterly absurd even to the most advanced intellects. Therefore those few great facts which were necessary to be indicated in order to point out the relation between the Creator and his works have been presented in a popular rather than a scientific form. Nor can it be said that they are any the less true because not presented in scientific phraseology. An excellent exposition of the harmony between the Mosaic and the geological record of creation is given by Prof. Dana at the end of his *Manual of Geology*, to which the reader is referred. See also Tayler Lewis's *Six Days of Creation* (1855).

Cosmos: See Cosmogony.

Cosne, kōn (anc. *Condate*): a town of France; department of Nièvre; on the Loire; 29 miles N. N. W. of Nevers. It has manufactures of hardware, cutlery, and anchors. Pop. (1896) 8,610.

Cosquin, Emmanuel: French author; b. June 25, 1841, in Vitry-le-François, Marne; translated from Fessler, secretary of the Vatican Council, *La Vraie et la Fausse Infallibilité des Papes* (1873) and *Le Concile du Vatican* (1877); has contributed much to periodical literature, especially articles on religious subjects in *Le Français*, and on folk-lore in *Romania*. The latter were collected and published as *Contes Populaires de Lorraine* (2 vols., 1866), forming an important contribution to the science of folk-lore.

Cossa, Francesco: painter; dates of birth and death unknown. He worked at Ferrara and Bologna, and may be considered one of the founders of the Ferrarese school. He was painting in 1456 and also in 1474. His most important existing work is the *Madonna with Saints* in the Bologna Gallery.

Cos'sacks [Russ. *Kozake*, prob. of Tartar origin]: certain Russian tribes first noted in the southern part of European Russia, now generally scattered over the empire. Their physical and political peculiarities have been curiously persistent. They are small, courageous, superstitious, and have many communistic principles. They have been given many political privileges, the most important of which are freedom from taxes and the rights of distilling, brewing, hunting, and fishing. They are now named by their present distribution as the Cossacks of the Don, of the Azof, of the Danube, of the Caucasus, Danube, Ural, Orenburg, Astrakhan, etc. Historically, they fall into two principal sections —the Cossacks of Little Russia, or of the Dnieper, and those of Great Russia, or of the Don.

The Dnieper Cossacks apparently originated in bands of refugees, of mainly Russian blood, which formed on the islands of the Dnieper in the thirteenth and fourteenth centuries. The unhappy condition of this region caused the community to grow, and by the sixteenth century it was strong and prosperous. Their government was democratic—the leader or hetman elective. Their services were lent to their powerful neighbors. Mazeppa was an Attaman (*q. v.*) of this people; he joined his forces to those of Charles XII. of Sweden, which called out the vengeance of Peter the Great, and led to the subjugation of the Dnieper Cossacks by Russia. Early in their history the more ardent adventurers had formed a military fraternity, called Zaporogians, bound by a vow of celibacy. They ultimately retired to the Crimea, then to Kuban, and a small band of them appears in history as late as 1828.

The Don Cossacks form a restless and warlike race, whose subjugation by Russia extended through centuries and left them with many special privileges. Their territory now constitutes a province of European Russia, with an area of 61,886 sq. miles, and a population (1889) of 1,896,113. They serve in the Russian army as light cavalry. Many half-savage tribes are excused, partly on account of their diminutive size and partly from their great aversion to a military life. M. W. Harrington.

Costa, Claudio Manuel, da: Brazilian poet and revolutionist; b. in the *arrial* of Carmo, Minas Geraes, June 6, 1729. He graduated in law at Coimbra, Portugal, traveled in Europe, and after his return lived at Villa Rica (now Ouro Preto), in Minas. He was known as a distinguished lawyer, who was often consulted by the colonial governors, and as a philosopher and poet of some note. About 1778 he joined in the revolutionary attempt known as the conspiracy of Tiradentes. On its discovery he was arrested, with the others, and committed suicide in prison (1789). Some of his sonnets and songs, published long after his death, are greatly admired for their purity and sweetness.

Herbert H. Smith.

Costa, Lorenzo: painter; b. at Ferrara, 1460. He is generally considered the founder of the Ferrarese school, but improperly. Much of his most important work is at Bologna, and during his middle life he was closely associated with Francesco Francia, so that his painting of that time is often confounded with that of the greater painter. For many years he lived and worked in Mantua, but nearly all his paintings there have perished. His chief works are the altarpiece of the Bacciochi chapel in St. Petronio, Bologna, wall-pictures in the same church, and paintings in the oratorio of St. Cecilia in the same city. There are good easel pictures in the Berlin Gallery and the London National Gallery, especially in the latter a *Virgin and Saints*, and in the Louvre a remarkable allegorical picture known as *The Court of Isabella D'Este*. D. in 1536. W. J. Stillman.

Costa, Sir Michael: composer and conductor; b. in Naples, of an old Spanish family, Feb. 4, 1810; studied in the Royal Academy at Naples; at the age of fifteen years composed a cantata, an opera at sixteen, and another at seventeen; also a mass, an oratorio, a *Dixit Dominus*, and three symphonies. In 1828 he was engaged by the manager of the Teatro Nuova to compose an opera, producing *Il Carcere d'Ildegonda*, and the next year his *Malvina* was composed for the San Carlo. In the autumn of 1829 his master, Zingarelli, sent him to England to direct the old master's psalm *Super Flumina*, but he sang in it instead of directing. He remained in England for the rest of his life, composing operas and cantatas, directing various societies and orchestras, and conducting different English festivals—the Birmingham from 1849 till his death, the Bradford in 1853, and the London 1874. He was the conductor of the Sacred Harmonic Society, and of the Händel festivals from 1857 till his death. His oratorios *Eli* (1855) and *Naaman* (1864) were composed for the Birmingham festival. In 1869 he was knighted by the Queen. He also conducted the opera at Her Majesty's theater, and wrote additional accompaniments for many of Händel's oratorios. D. in Brighton, Apr. 29, 1884. D. E. Hervey.

Cos'ta Cabral', Antonio Bernardo, da, Count of Thomar: a Portuguese statesman; b. May 9, 1803; became Minister of State in 1839. He controlled the government, supported by the court, but by oppressive unconstitutional measures—the abolition of the irremovability of judges, the establishment of a rigorous censure, etc.—he brought upon himself the hatred of all parties. He was obliged to retire in 1846 in consequence of a popular insurrection, was recalled in 1849, but was obliged to flee the country in 1851. His brother Silvo led the opposition. Antonio returned to Portugal in 1852, and from 1859 to 1861 acted as ambassador to Brazil. D. Sept. 1, 1889.

Costa Carvalho, José, da: Brazilian statesman; b. at Nossa Senhora da Penha, Bahia, Feb. 7, 1796. He studied law at Coimbra, Portugal, and was an *ouvidor* at São Paulo. Embracing the cause of Brazilian independence, he was a member of the Constituent Assembly of 1822, and deputy to several parliaments. At first he voted with the liberals, but in 1838 joined the conservative party. In 1839 he entered the Senate; was president of São Paulo in 1842, during a period of revolt in that province; and in 1848 he was called to form the Conservative cabinet which suppressed the revolt in Pernambuco and brought the war with Rozas to a successful issue. Costa Carvalho was named Baron of Monte Alegre in 1841, viscount in 1843, and marquis of the same title in 1854. D. in Rio de Janeiro, Sept. 18, 1860.

Herbert H. Smith.

Costan'oan Indians [from the Spanish *costanos*, coastmen]: a linguistic family of North American Indians whose habitat formerly embraced several of the present counties of Western Central California, extending from the Golden Gate

southward to Point El Sur, eastward to Soledad, thence by an irregular line to Gilroy Hot Springs and the upper waters of Conestimba creek, to San Joaquin river as far as its mouth. The northern boundary was formed by Suisun Bay, Carquinez Straits, San Pablo and San Francisco Bays, and the Golden Gate.

Physically considered, the natives comprising this as well as other Californian groups residing mainly on the coast were of low type. They lived in rude thatched huts, and subsisted chiefly upon fish and mollusks, nuts, roots, and seeds.

The activity of the Spanish missionaries was great among the Costanoan Indians, the missions of San Francisco de los Dolores, Santa Clara, San José, Santa Cruz, San Juan Bautista, San Carlos, and Soledad being established in their territory between 1770 and 1797, and to these missions were attached a large number of *visitas*.

Strict sedentary life, arduous tasks, and disease decimated these tribes, and now only about thirty individuals survive. Most of these, constituting the remnants of the Rumsen tribe, are to be found near Santa Cruz and Monterey. Only the older individuals speak the native tongue.

Following were the principal Costanoan divisions: Ahwaste and Altahmo, on San Francisco Bay; Aulintac, named from their village, under Santa Cruz Mission; Carquin, south of Carquinez Straits and eastward to the mouth of the San Joaquin; Mutsun, in and about San Juan Bautista Mission, San Benito County; Olhone and Romonan, on San Francisco Bay; Rumsen, on coast from Pajaro river to Point El Sur; Thamien, between the Almaden mines and Alviso Landing, Santa Clara County, also in Santa Clara valley; Tulumo, on San Francisco Bay.

AUTHORITIES.—H. H. Bancroft, *History of California*, vols. i.–vii. (San Francisco, 1884–90); H. W. Henshaw, *Missions and Mission Indians of California*, in *Popular Science Monthly* (Aug., 1890); Powell, in *Cont. N. A. Ethn.*, iii. (Washington, 1877). Consult also works cited therein. See INDIANS OF NORTH AMERICA. F. W. HODGE.

Costa Rica, kōs'tăă-ree'kăă (i. e. rich coast): the southernmost country in Central America; connecting Colombia with Nicaragua, with the Caribbean Sea on the N. E. and the Pacific Ocean on the S. W., and lying between the parallels 8° and 11° 16′ N. and the meridians 81° 40′ and 85° 45′ W. Area, 20,873 sq. miles. The northern boundary is formed by the river San Juan and the southern shore of Lake Nicaragua; the southern is unsettled, both Costa Rica and Colombia claiming the vicinity of the Bay of Chiriqui. The total area is 23,233 sq. miles. The Caribbean coast-line is 180 miles long, and the Pacific about twice as great. The cordillera which forms the backbone of the country is fairly well defined in the N. W. and S. E., but much broken up in the center. The highest point is Pico Blanco (11,800 feet). There are six volcanoes, only two of which (Irazú and Barba) have given signs of activity in late years; the first is the highest volcanic peak (11,600 feet). There are many small rivers, the drainage usually being N. E. or S. W., and the fall great. The climate is hot along the coasts and inland to an elevation of about 3,000 feet. The temperature is, however, lowered by the trade-winds and sea breezes, the mean varying from 72° F. to 82° F., the latter on the Pacific side. The region of the hot climate comprises about one-third of the republic, and is adapted to the cultivation of the banana, cocoa, vanilla-bean, sugar-cane, and other tropical plants. A temperate region is found on the mountains from 3,000 to 7,500 feet above the sea. The lower slopes are the populous portions of the state, have a very salubrious climate, are well watered and very fertile, and are largely devoted to coffee-growing. The higher slopes gradually pass into the cold region of the higher mountain-tops, the mean temperatures running from 68° F. to 57° F. The dry season generally begins in November and ends in April, and is called the *verano* or summer. The rainy season extends from May to October, and is called the *invierno* (winter). The Meteorological Institute of San José is making elaborate studies of the climate.

Productions.—The mineral wealth of the country is great, and has been known from the time of Columbus. Gold is the principal metal mined, and is found both in the rock and in placers. Silver, lead, and copper are also found. The forests are extensive, and yield mahogany, cedar, rosewood, lignum-vitæ, granadillo, and Brazil-wood. Annotto is also abundant, and a superior quality of indigo is grown. Among medicinal plants the castor-bean, croton, cassia, sarsaparilla, ipecacuanha, ginger, rhubarb, tamarind, and licorice may be mentioned. India-rubber is produced in considerable quantities. Coffee was first planted here in 1796, and its production has long been the principal industry of the country. Banana exportation began in 1880, and has now reached considerable proportions. Sugar, cocoa, tobacco, maize, cotton, and indigo are produced, and cattle raising is an important industry.

Government.—The state is a republic with a president and one legislative chamber of twenty-six members, elected for four years. The army consists of 600 men, and the militia of about 34,000. The revenue for 1899 was 8,413,199 pesos, and the expenditures 8,069,748 pesos, of which 5,232,168 pesos were expended for government, and 1,377,525 for debt. The peso is worth about 46 cents. The revenue is derived mainly from customs and the monopoly of spirits and tobacco. The total internal debt in 1899 was 2,922,221 pesos; foreign debt, approximately, £90,000. The territory is divided politically into five provinces and two sparsely settled comarcas. The most densely populated province is San José, nearly central on the Pacific coast, and containing the capital San José. The others, in order of population, are Alajuela (N. of San José), Cartago (S.), Heridia (E.), and Guanacaste (on the Pacific coast, N. of the Gulf of Nicoya). The comarcas are Puntarenas (on the Pacific coast, S. of San José) and Limon, which occupies the entire Carribean coast.

The imports in 1898 were valued at 4,258,896 pesos, the exports 5,659,219 pesos, of which coffee composed nine-tenths. About one-fifth of this coffee goes to the U. S. The imports from the U. S. amounted to 3,078,258 pesos, larger than from any other country. There are 131 miles of railway, 917 miles of telegraph lines, and 200 miles of telephone lines.

Population.—A census taken in Nov., 1883, gave a population of 182,073, with an estimated addition of 18,207 unenumerated and 3,500 aborigines (Guatusos, Talamancas, and Chirripos), making a total of 203,780. According to the census of Feb. 18, 1892, the population, as far as enumerated, was 243,205. In 1889 there were 1,228 marriages, 9,151 births (nearly 20 per cent. illegitimate), and 5,238 deaths. This gives a death-rate of 22 per thousand, which is high for a rural population, and is probably due to careless treatment of the young. Since 1894 the immigration has been about 1,000 annually. The people of Spanish descent dwell in or near the larger towns. Immigration is encouraged, and there are many small settlements of English, French, Germans, and Italians. Education is compulsory and free. In 1898 there were 327 public schools with 15,000 pupils, and 90 private schools with 2,500 pupils.

History.—Honduras was discovered by Columbus in 1502, and was called *Costa Rica* because some gold was obtained and rich mines were supposed to exist. It remained in colonial times a province of Guatemala, was proclaimed independent in 1821, and in 1824 became a state in the United Provinces of Central America. Since the dissolution of that confederacy in 1848 it has remained an independent republic. The population is more homogeneous and progressive than in most other Central American states. For information as to its antiquities, see CENTRAL AMERICAN ANTIQUITIES.

REFERENCES.—Calvo, *La República de Costa Rica* (1887) and *The Republic of Costa Rica* (1880); Biolley, *Costa Rica and her Future* (translation, 1889); Bureau of Am. Republics, *Costa Rica* (Bulletin No. 31, 1892); also the official reports of the Government. MARK W. HARRINGTON.

Costa-Rican Antiquities: See CENTRAL AMERICAN ANTIQUITIES.

Costel'lo, LOUISA STUART: English author; b. in 1799. She wrote a number of semi-historical novels and books of travel, which were very popular in their day. In her early years she was a painter of miniatures. D. Apr. 24, 1870.

Cos'ter, or **Koster**, LAURENS JANSZOON: mentioned by Adrian Junius in *Batavia* (an historical work published at Leyden in 1588, but supposed to have been written twenty years earlier), as the original inventor of movable types between the years 1420 and 1440. The story is that he first cut letters out of wood, and printed from them the Dutch *Hailspiegel*, and that afterward he made his letters from lead and tin, and called in assistants, whom he swore to secrecy. One of these assistants, named Faustus, made away with his master's tools and type, and settled at Mentz, where about 1442 he brought out the *Doctrinale* of Alexander Gellus with the very type which Coster had made at Haar-

lem. This story has always been upheld by the Dutch, but in 1870 one of their countrymen, Dr. Antonius van der Linde, made a vigorous assault upon Coster's claims. Meerman was the first writer of note to investigate the story of Junius and furnish corroborative details, and so general is the belief in Coster's claims that a statue, erected to him in Haarlem, bears the inscription "Inventor of the art of printing with movable letters cast of metal." Another statue is in the public gardens in the same town. It is not known when or where he died, though he was alive in 1483. See Hessels, *Haarlem, the Birthplace of Printing* (1888); also *American Dictionary of Printing and Bookmaking* (New York, 1892).

Cos'tigan, John: Canadian cabinet minister; b. at St. Nicholas, Levis co., P. Q., Feb. 1, 1835, and educated at St. Ann's College. He was a member of the New Brunswick Assembly 1861–66; entered the Dominion Parliament in 1867, and has been re-elected at each subsequent general election up to and including that of 1891. He became Minister of Inland Revenue in 1882, a portfolio which he now (1893) holds. He has been a judge of the inferior court of common pleas of New Brunswick. He attained some notoriety in 1882 as the mover in Parliament of an address to the Queen praying that she would grant home rule to Ireland.

Neil Macdonald.

Costiveness: See Constipation.

Costume [from Fr. *costume*, an Ital. loan-word; cf. Fr. *coutume*; both from Vulg. Lat. forms of *consuetu'do, -inis*, usage]: dress and the ornaments of the person, taken in a general sense, and especially a national or provincial or local style of dress, prevailing for a length of time and free from sudden modifications. Thus in recent times the Japanese have to some extent given up their national costume and adopted European dress, while the Chinese have retained their national costume, although the Chinamen in the U. S. wear some garments which are not a part of that costume. We do not say that the Japanese have adopted European costume, however, for there is no such thing, except in the general sense that European men wear trousers and coats of woolen fabric, shirts of cotton and linen, and boots of leather, while the women wear gowns fitted closely to the body from the waist up, and flowing loosely below the waist down to the ankles or lower. These conditions are too general to constitute a costume, and the special shapes, colors, and materials change too often and too capriciously, and too much as a matter of deliberate choice, to allow a costume to exist. But the gown and wig of an English barrister constitute a costume; so does the dress of the Bedouins of the desert, for it has not changed for ages in any important feature; so does the dress of this and that valley of Southern Bavaria or Tyrol; so does the blouse of the French mechanic, and the smock-frock of the English country laborer. These are all traditional, they survive from old times, and continue in use merely because the people who wear them do not feel inclined to change.

If the people of the U. S. were to take up the blouse for their summer wear, it would be not a costume but a fashion. If we can imagine their continuing to wear it for a century it would have something of the nature of a costume. So the suit of white linen which "Mark Twain" gives to Col. Grangerford in *Huckleberry Finn* was in one sense a costume, because all the men of his class wore it and had worn it for years without thought of change; but it was not quite a costume, because it was a part of the modern European and American dress, and was therefore not peculiar in cut or fashion.

The history of costume can not be fully written as yet, because the monuments of art upon which it must depend have not been compared and analyzed with any thoroughness. Even the costumes of the Romans and Greeks in classical times are only half understood, and very many questions regarding both still remain unsettled and disputed. Greek authors mention garments by names of which we do not know the meaning; in Greek statues and vase-paintings are shown garments of which we know neither the names, nor the real shape and make, nor the utility. We do not know for certain what garments a Roman woman wore under her large and loose *palla*, if, indeed, it is the palla. In the crust of ashes at Pompeii there are cavities which formerly contained the bodies of persons smothered at the time of the city's destruction. These bodies crumbling away have left hard, shell-like molds. A plaster cast of one of them has revealed to us a woman's garment whose existence in Roman imperial times had never been suspected by modern students. And the very numerous men's garments which were introduced during the time of the empire, as we are told by contemporary writers, we are generally not able to identify. This uncertainty is yet greater in respect to less known peoples.

The earliest sculptures found in Mesopotamia, dating perhaps 3,000 years before Christ, show in common use a garment made of a large oblong piece of stuff carried over the left shoulder and under the right arm, the two edges overlapping along the left side of the body and left leg. The same garment appears in Egypt at about the same date; it is common in Assyrian sculpture and in the monuments of the great Persian empire of the sixth century B. C. to the second, and we know it as the Grecian *peplos*. Its edges are often ornamented with fringes and with borders which are sometimes of very rich embroidery. It appears often as the only garment of either sex. But the Egyptian women are shown with this single garment drawn very closely around body and limbs, so that all the form is distinctly seen, while the Greek vase-paintings of all epochs show it as much more loosely worn, the forms wholly concealed except where it flies open at the left side. Men who wear this garment are always of some rather elevated social position; the workmen in the fields, mechanics, merchants, and even superintendents and officials are commonly shown in the Egyptian and Asiatic monuments with no garment except a piece of stuff hanging from the waist-belt, and arranged so as to cover the thigh to the knee. In the hot lands of the Eastern Mediterranean this was the dress of most men in antiquity; the thick woolen cloak used by the modern inhabitant of these same regions very seldom appears in the ancient monuments, and we are left equally unable to understand how the men of old time protected themselves from the heat of the noonday sun, and how the Greeks and others who had a winter to face kept themselves warm in cold weather. The Assyrian princes and nobles are shown as entirely covered with clothing, and they have, what is remarkable, sleeves, though short ones. But it seems generally the shirt or inner tunic which has sleeves, and the whole dress may be taken as consisting of this shirt with the above-described wrapping garment, or a larger and fuller one worn over it.

Fig. 1.—Greek vase-painting: Warrior wearing the *chlaina* or *pharos* and a crested helmet, leading a female captive wearing the *chiton* and the *kaluptra* or long veil.

During what we may call the classical age, from about 500 B. C. to 300 A. D., it is noticeable that the non-Greek peoples of Western Asia and Egypt are more inclined to

cover and conceal the person than the Greeks. Even the women are much less heavily draped among the Greeks than in Asia. The *chiton* or shift of the Greek women (see Fig. 1) was made of one piece of stuff just as it left the loom, but with the opposite edges sewn together so as to make a straight case or tube of stuff open at both ends. This could be folded over at top, forming a kind of cape. Whether so

Fig. 2.—Greek vase-painting: Bacchus, wearing the chiton and chlamys, is overthrowing a giant wearing a chiton and a crested helmet, and carrying a large round shield and a sword of unusual form.

arranged or not, the top edge passed under both arms and was then brought up to meet at the top of each shoulder, and held there by a brooch or clasp, the arms left free, and loose folds of stuff formed under each arm. Sleeves for the upper arms could then be made by pinning the top edges of the garment together at several points. When a waist-belt was worn, the long shift could be pulled up so that the feet and ankles and a part of the legs were left free; the loose fold of the stuff then fell outward over the belt, hiding it, and this feature has often been mistaken for another garment. The men's shirt was not unlike this, but generally much shorter (see Fig. 2). Either sex would wear the peplos over the chiton (see Fig. 4). But men are more often represented wearing a very loose cloak, which we know from Greek authors as the *chlaina*, the *himation*, the *chlamys*, and by other names between which it is very difficult to distinguish. In these cloaks there was probably no sewing at all, unless in the case of the ornamenting of the edges, and not often then. These cloaks are continually represented as the only garment of the younger men (see Fig. 1), and it is one of the puzzles of this subject how far we are to take this as the common custom of Greek life, and how far it is the result of the interest which Greek sculptors took in the nude body.

Fig. 3.—Greek vase-painting: King or chief with a long *chiton* and a *chlaina* over it.

The Roman costume was not very unlike that of the Greeks, for in earlier times the dress of all the Italians seems to have been akin to that of more Eastern peoples, and afterward the Romans drew most of their ideas of life from Grecian sources. But one peculiar garment they had, the *toga* (see Fig. 5), a very large and loose cloak which was worn by all citizens when out of their homes and in the city, but thrown off indoors, and little

Fig. 4.—The peplos worn over the chiton.

worn in the country. The statues indeed show it to have been extremely cumbrous. Its shape has been much disputed, but it seems to have approximated to a half circle of from 10 to 12 feet diameter. Many modern archæologists have experimented upon this and other shapes by draping them actually upon living men. One high authority has pronounced for a sort of crescent of an elliptical rather than a circular curve, with another smaller ellipse of stuff sewed into the inner and concave curve of the large crescent. When not wearing the toga, the shirt and the cloak constitute the chief dress of the Roman man; his armor was put on over the shirt, and the cloak worn over the armor again. The shirt was called *tunica*, and the under one when two were worn was the *subucula*; the cloak was called *sagum*, *pallium*, and *paludamentum* (see Fig. 6). Besides these names, Greek, Oriental, and even Gaulish or German names were given to various modifications of the familiar gar-

Fig. 5.—Roman statue of an orator or scholar wearing a full *toga*.

ments, for Rome became at a relatively early time the head of a cosmopolitan community and state, and all customs and all costumes had their day and their admirers.

One marked distinction there was between the people of the Græco-Roman world and their preeursors, on the one hand, and the nations whom they called barbarians and who half surrounded them on the E., N. E., and N., on the other hand: these latter wore trousers. It is a most curious subject for inquiry, this general use of what the Romans called *bracae*, among so many and so different peoples, inhabiting such different climates, as Gauls, Germans, Scythians, Persians, and Parthians; or the people of modern Northern France, Belgium, Holland, Northern Germany, Hungary, Russia, Tartary, Persia, Afghanistan (see Fig. 6). It may be assumed, however, that these garments originated in cold climates, and were only kept in use by those who had often to visit cold regions; thus the Parthian and Persian princes are represented wearing *bracae* in the hot lands of Mesopotamia, but those prinees had come from the high lands of the interior, where the winters were severe. Moreover, the Romans adopted the *bracae* in their campaigns, and apparently in peaceful life as well, when to the N. of the Alps, but abandoned them at once when they re-entered Italy. The people of the peninsula of India have never adopted trousers in eommon life; the Chinese seem not to have used them before the establishment of the Tartar dynasty. The Japanese have never included them in their native costume; except always that, among these various peoples, as also among the Scotch Highlanders, trousers of some sort have often been worn by individuals, sometimes as a mark of social dignity and high official or hereditary position.

Fig. 6.—Roman statue of a northerner wearing the *bracae*, a girdled *tunica*, and the *sagum* or *abolla* fastened with a brooch.

Fig. 7.—Lady's dress of 1280: Loose mantle, with band to hold it across the breast, like a cope, worn over a *bliaut* or other gown; wimple and long veil.

A kindred garment, the stocking, appears first in the early Middle Ages. Quicherat, an excellent authority, assumes that stockings or socks began to be used only when the classical traditions of personal cleanliness and eonstant bathing had been lost, at the beginning of that long epoch of uncleanliness which has not closed yet for the people of the greater part of Europe and the European settlements. In the eighth and ninth centuries of our era in Europe there is visible a constant struggle between classical traditions and new conditions: in the miniatures some of the highest personages are represented with bare legs, some with trousers, and some with long stockings and short skirts, like a Highlander of the sixteenth century, while the most eommon style of dress seems to have ineluded cloaks so long and full that when they were worn all other details of costume are concealed. The long cloak is indeed almost a badge of dignity, being as it is incompatible with active and toilsome occupation. As late as the fifteenth century the dress of a courtier was essentially a robe reaching to the feet. It is not until the reigns of Louis XI. in France and Edward IV. in England that the effigies and miniatures at last show noblemen and princes in short cloaks and doublets, when not engaged in the chase or in active sports; and at a much later time still the dress is not considered complete until the long robe is superadded.

What the nobles wore the citizens always adopted so far as they dared brave or disregard the laws of the time against extravagance and the confusion of classes. In proportion as a man is "in doublet and hose," as a later phrase expressed it, he is either (1) of lower condition or (2) engaged in the chase, in traveling or (3) is in undress in his own apartments, although in the last case a long furred gown is, till the seventeenth century, the winter wear of sedentary men. It is to be noticed that throughout the thirteenth, fourteenth, and fifteenth centuries there is complete confusion between stockings and trousers. Sometimes the same garment covers the feet and reaches to the waist; sometimes the long stockings come only half-way up the thighs, and are secured in some way not made clear; sometimes they are parted at or near the knee; and these distinctions obtain among nobles, citizens, and field-laborers alike. Hence the terms *haut-de-chausses* and *bas-de-chausses* (the upper hose and lower hose), from which comes the modern French word *bas* for stockings. Corresponding English words were trunk-hose (the hose of the trunk or body) and nether-stocks.

Fig. 8.—Lady's dress of about 1450: The sleeves tight, with upper hanging sleeves purely ornamental, covered with fur in small pieces; hawking glove on left hand.

During the Middle Ages the costume of women was more nearly constant than that of men because the principal garment was always a gown, more or less closely fitted from the hips upward, and very loose and full in the skirts. It is only in the statues earlier than the thirteenth century that any resemblance to the ancient girdled shift is to be seen, and this seems to be always a piece of ceremonial court dress, probably a survival of classical times. Otherwise the gown always has sleeves, and is close around the neck and shoulders, and fitted to the waist in such a way as to require much cutting and sewing, and the great fullness of the skirts combined with the snug fit at the waist and hips points to the free use of gores (see Fig. 8). Within this general limit of style many differences existed: in the thirteenth century an overdress without sleeves and with a skirt reaching to the knees showed the longer skirt and the sleeves of another gown beneath; in the fourteenth century the overdress swept the ground, and was eonstantly held up or looped up to show the underskirt—it had short sleeves, too, showing the sleeves of the undergown to the wrist; in the fifteenth century the undergown had its bodice eut low in the neck, and its skirt reaching the ground, while the

Fig. 9.—Dress of young man of good family, about 1490. Fur-lined short cloak, worn over a loose *cotte* or tunic.

overdress was open in front, but came higher on the shoulders, and its skirt was carried out to a long train for ladies of wealth and their imitators, while a broad belt kept all the complicated attire in place. In the fourteenth century, too, was worn that jacket which is so commonly taken by modern artists as a general dress for their mediæval ladies, the curious garment with an edging of fur sweeping down from the shoulder to the hips on each side, a fashion which prevailed so long that a heraldic bearing was derived from it. Varied as were the styles of dress, and far removed from classic simplicity of make for both men and women, it must be said that the shape and the movements of the body were studied, and that they controlled the style of garments throughout the Middle Ages. The whims of fashion were rather shown in the hoods and hats, the caps and veils of the time, for which see HEAD-DRESS.

The end of the Middle Ages is marked at once by the change in architecture from a natural to a deliberately copied style, the almost complete abandonment of body-armor except by the richest men, who could pay for the costly bullet-proof corselets and taslets of the day, and who, moreover, were mounted in battle and on the march, and finally a general abandonment of simplicity and reasonableness in dress, and the introduction of the most fantastic tailoring and trimming for both sexes. Splendid stuffs, such as silks brocaded with flowers, satin of rich design and color, velvet both plain and figured, and cloth of gold and of silver, became common among the nobles of the courts of Europe. The display at a tournament or other court function must have been in every way more splendid than we can now imagine, for men vied with women in the splendor of their material, and the strangeness of cut and shape of their garments, when embroidery was freely lavished upon cloaks, horse-housings, banners, and hangings, and heraldic display gave an excuse for the most positive colors in bold contrast; when, too, rich men and women did not leave to their servants the use of color and gold, of badges and significant devices, but themselves wore garments of unrestrained magnificence and enormous cost.

But the general fashion of men's dress in the middle of the sixteenth century, Henry II. reigning in France and Edward VI. in England, is not so unnatural; it may be described as follows: A gentleman wore a doublet or pourpoint with long sleeves, fitting the body and arms easily, girded at the waist, having short skirts below the belt but not reaching much below the hips; trunk-hose made very large and full, stuffed out with hair or wool or held in place with some elastic material, so that the skirts of the doublet had to be cut with a decided shape to allow of them; the stockings fitting tight to the thigh and leg, a fashion helped by the introduction at this time of *tricot*, or what we call now "Jersey" or stocking-stuff, the elastic material of our modern underclothes; over the doublet would be worn a full cloak, resting on both shoulders or on one and capable of being drawn around the body, but very short, scarcely reaching the hips. All this might be plain enough, though of some delicate choice of color and of braiding or trimming, but these garments could also be made very showy with plaits which, seeming to be in one rich material, showed as they open another even more splendid within, with gold and silver lace, or rather passementerie (real lace in the modern sense did not exist), with buttons of precious material mounted in gold, with embroidery and the use of pearls and precious stones in the embroidery itself. The dress of women had changed less from the mediæval type; it was not irrational in shape and make.

The greatest extravagances of dress came in with the last years of the sixteenth century. Those were the days of excessive stuffing, or *bombasting*, as it was called afterward. The trunk-hose were stuffed out so enormously that it was with great difficulty that the sword could be worn. And this was followed by the stuffing of the doublet into that extraordinary shape which is perpetuated for us in the protruding abdomen of Punch. The Louvre portrait of Henry II. shows the funnel-shaped termination of the body of the doublet reaching far below the waist. The habit of using thick stuffing of this sort had been gained in warfare, for very much of the armor of the time was made up of garments *gambisés* or bombasted; thus the hugest trunk-hose known to us are shown in engravings of the time as a part of the war dress of 1563, and the gambeson for the body in many forms had been worn for at least three centuries. At this time, about 1580, starch was introduced, and was immediately put to use in stiffening the neck-ruff, which, beginning with a diameter of perhaps a foot, soon attained a breadth equal to that of the shoulders, and was worn by both sexes for forty years together. While the men wore the bombasted doublet, the women pinched their waists as much as nature could bear; a surgical work of the time describes the effects of this with the ribs forced to overlap one another; and these slender waists were prolonged downward by the immensely long and pointed stomacher, from which the skirt puffed out behind and at the hips to a circumference of 10 feet or more, which size it retained to the floor. A court lady of the reign of Henry III. of France should be contrasted with a Greek lady of 390 B. C., as seen in the bas-reliefs of the time, for a full understanding of the natural and the sophisticated in matters of costume.

From A. D. 1600 to the time of the French Revolution whimsical extravagance of taste governed fashionable dress, a pretense at simplicity in the dress of one sex being accompanied by wild vagaries in that of the other, and followed by equally strange ones of its own. It is difficult for us to realize the fantastic unreason of the outfit of a *mousquetaire* of Louis XIII.; or to conceive how the simple head-dress with curls which we associate with Madame de Sevigné could be followed by the "tower" of lace on the head of a lady of 1690, and that by the structure of gauze, lace, flowers, and feathers which, combined with the puffed and cushioned hair, rose above the head of a lady of Marie Antoinette's court. The only parallel to these is in the gown of the same lady, 18 feet in circumference at the floor, very nearly as great at the hips, decorated with festoons and bouquets in a way which can not be described here, or else in the men's wigs of an earlier epoch.

With 1750 the waistcoat and coat had been evolved from the doublet and cloak, the waistcoat having still the long flaps which were left from the skirts of the doublet. Knee-breeches and long stockings were the nearly unchanged hose of the Middle Ages. Pantaloons followed knee-breeches, and were worn for a very short time; they fitted the leg snugly, and were buttoned or tied at the ankle. Trousers followed these; the flaps of the waistcoat disappeared, and the costumes of the past were all merged into the uniformity of the last eight decades. What costumes still remain in existence are to be found where modern progress toward uniformity and modern disregard of individuality of design and of style have not penetrated. Women indeed retain the taste for novelty and for brilliancy of attire, but have lost the power of regulating it; costume has been lost in fashion. For bibliography, see DRESS. RUSSELL STURGIS.

Cosway, RICHARD, R. A.: English miniature-painter; b. in 1740. He studied in London under Hudson, and in 1771 became a member of the Royal Academy. He painted figure-pieces in oil, but devoted himself chiefly to the production of miniatures which have become almost classical in his school. D. July 4, 1821.

Cot, kōt, PIERRE AUGUSTE: figure and portrait painter; b. in Bédarieux, Hérault, France, Feb. 17, 1838; pupil of Léon Cogniet, Cabanel, and Bouguereau. His pictures are attractive in composition, but not of extraordinary technical merit. *Mireille* (1882) is in the Luxembourg Gallery, Paris. D. in Paris, Aug. 18, 1883. W. A. C.

Cotabanamá, or **Cotubanamá**: Indian cacique of Higuey, the eastern province of Haiti, at the time of the conquest. He is described as of great stature and immense strength. In 1502 some of his tribe attacked a Spanish boat and massacred the crew in revenge for injuries which they had received. The governor, Ovando, sent Juan de Esquivel to punish them. Cotabanamá resisted, was subdued, and for a time was on friendly terms with the whites; but when he was required to cultivate land for the Spaniards and carry the produce to San Domingo he again rebelled (1504). Esquivel again defeated him, and he took refuge in a cave on the island of Saona. He was soon discovered, taken to San Domingo, and hanged by order of Ovando (1504). HERBERT H. SMITH.

Côte-d'Or, kōt'dōr' (i. e. region of gold, named in allusion to the wealth of its vineyards): department in the eastern part of France, formed of a portion of the old province of Burgundy. Area, 3,383 sq. miles. The surface is diversified by hills and valleys, and partly traversed by a chain of low mountains called Côte-d'Or. It is drained by the rivers Seine, Aube, and Saône. Among its minerals are coal, iron, marble, and gypsum. A large part of this department is covered with forests. The soil is mostly fertile, producing 18,500,000 gal. of wine annually. Here are raised

the celebrated Burgundy wines. Capital, Dijon. Pop. (1891) 376,866; (1896) 368,168.

Cotelerius, Jean Baptiste: scholar; b. in Nîmes in Dec., 1627. He studied theology and philosophy in Paris, but declined ordination. In 1649 he became a lay member of the Sorbonne; in 1654 counselor of the Archbishop of Embrun; in 1659 returned to Paris; was in 1667 appointed assistant librarian in the royal library, and earned great literary reputation by his edition of the apostolic fathers (Barnabas, Clement, Hermas, Ignatius, and Polycarp, Paris, 1672, 2 vols.). Most of the copies of the original edition were destroyed by a conflagration, but new editions appeared in 1698 and 1724. In 1676 he became Professor of Greek in the Royal College at Paris. D. in Paris, Aug. 12, 1686.

Cotes, Roger: English clergyman; b. in Burbage, July 10, 1682; fellow of Trinity College, Cambridge. He became Plumian Professor of Astronomy in 1706, and published the second edition of Newton's *Principia*, with a learned preface (1713). He wrote *Harmonia Mensurarum* (1722). D. June 5, 1716. Newton had so high an opinion of his abilities that he exclaimed, "Had Cotes lived, we might have known something."

Côtes-du-Nord, kōt'dü'nōr' (i. e. northern coasts): maritime department of France; formed of part of the old province of Bretagne. It is bounded on the N. by the English Channel, on the E. by Ille-et-Vilaine, on the S. by Morbihan, and on the W. by Finistère. Area, 2,659 sq. miles. The surface is partly mountainous; the soil is mostly fertile. Many horses and cattle are reared here. Large quantities of grain and linen goods are exported. Among the minerals are iron, lead, and granite. Capital, St.-Brieuc. Pop. (1891) 618,652; (1896) 616,074.

Cotgrave, Randle: lexicographer; b. in Cheshire, England; admitted as scholar at St. John's College, Cambridge, Nov. 10, 1587; later became secretary to William Cecil, Lord Burghley; published in 1611 an excellent French-English dictionary, of which there appeared in 1632 a second edition, together with Robert Sherwood's English-French dictionary; and in 1650, 1660, and 1673 editions revised and enlarged by James Howell. The work is of great value to philology. The year of Cotgrave's death is given as 1634 in Cooper's *Memorials of Cambridge*. C. H. T.

Cöthen: See Köthen.

Co-tidal Lines: a system of lines drawn upon a map, terrestrial globe, or chart, to illustrate the course of the tidal wave. Each of these lines passes through the places which have high water at the same hour, thus tracing the crest of the wave, and enabling the eye to follow its course with all the modifications that it experiences in each ocean. See Tides, Ocean, and Gulf Stream.

Cotin'ga: any one of several South American birds of brilliant plumage, belonging to the family *Cotingidæ*. The best known is *Cotinga cayana*, a bird a little smaller than the North American robin; of a brilliant azure blue with a purple throat. Other notable members of the family are the Bell-bird and Umbrella-bird (*qq. v.*). F. A. L.

Cotocachi, kō-tō-kaăt'-chee: a mountain of Ecuador; in the western Cordillera, about 60 miles N. of Quito. It is of volcanic formation, but no crater has been found on its summit, nor are there records of eruption. The lake, Cui-cocha, at its southeastern base occupies an old crater of explosion, and shows two cones rising from the water. The sides of Cotocachi are steep and broken by deep fissures, said to be the result of earthquakes. These and the icy summit make the ascent extremely difficult. Whymper, who reached the top in the year 1879, found it 16,453 feet high.

Herbert H. Smith.

Cotopax'i: a volcano of Ecuador; in the eastern Cordillera of the Andes; 40 miles S. of the equator and about the same distance S. S. E. of Quito. It is the highest active volcano in the world, recent and very careful observations by Whymper giving 19,614 feet above the sea, or 10,000 feet above the valley of Quito; of this about 4,600 feet is covered with snow. The form is almost perfectly conical. The eruption of 1534, ascribed to this mountain, was probably from Pichincha, but there have been many recorded outbreaks since 1742; some of them have sent out clouds of ashes which darkened the air for many miles around and fell on ships far out at sea; in others it is said that flames shot up several thousand feet. During the eruption of 1803 Humboldt heard the explosions at Guayaquil, 135 miles distant. In 1877 an outburst of cinders was followed by a deluge of water, mud, and stones, which in a single day reached the sea, over 200 miles distant. The top of Cotopaxi was first reached by Dr. W. Reiss in 1872; Whymper spent a night on the brink of the crater, which is 1,300 feet deep. See Whymper, *The Great Andes of the Equator*; Orton, *The Andes and the Amazon*. Herbert H. Smith.

Cotswold Hills: a range of oölitic limestone hills running through Gloucestershire, England, parallel to the Avon and Severn. They are 54 miles long and average 600 feet high, Cleeve Hill, the highest point, having an altitude of 1,134 feet.

Cotta, Bernhard, von: German geologist; b. in Kleinen-Zillah, in the Thüringerwald, Oct. 24, 1808. His father was director of the academy at Tharand, and he was from early youth made familiar with natural history, especially mineralogy and geology. He afterward studied in the mining-school at Freiberg and at Heidelberg, and was in 1842 appointed professor in the former place. Among his important works are a geognostic map of Saxony in twelve sections, published conjointly with Naumann; *Geognostische Wanderungen* (2 vols., 1836–38); *Anleitung zum Studium der Geognosie und Geologie* (3d ed. 1849); *Geologische Bilder* (4th ed. 1861); *Deutschlands Boden* (2d ed. 1858); *Geologie der Gegenwart* (3d ed. 1871). D. at Freiberg, Sept. 14, 1879.

Cotta, Johann Friedrich, Baron von Cottendorf: publisher; b. in Stuttgart, Apr. 27, 1764; conceived at Tübingen in 1794, with Schiller, the plan of the *Allgemeine Zeitung*, an able daily journal, afterward published at Augsburg and now at Munich. He was a friend and liberal patron of Goethe and Schiller, whose works he published. He established a steam press at Augsburg in 1824. He was for many years a member of the Würtemberg Diet, and in 1824 was elected vice-president of the second chamber. D. Dec. 29, 1832. See *Briefwechsel zwischen Schiller und Cotta* (Stuttgart, 1876). Revised by Julius Goebel.

Cotta, L. Aurelius: Roman senator; became prætor in 70 B. C. He was consul for the third time in the year 65, and co-operated with Cicero against Catiline in 63 B. C. He was an adherent of Cæsar in the civil war which began in 49 B. C.

Cottabus: a game of skill often spoken of by Greek writers (Anacreon, Æschylus, Euripides, Antiphanes, Aristophanes) and depicted on Greek vases. It consisted in throwing a portion of wine left in the drinking-cup in such a way that it passed through the air without its bulk being broken and fell with a certain noise into another drinking-cup. The performance of this feat required no small amount of dexterity, as the thrower was expected to retain the recumbent position usual while eating and drinking, and excellence in the game was admired as much as excellence in throwing the javelin. The excitement of the game was often still further increased by bets and by the ominous character ascribed to it.

Cottage City: originally a noted camp-meeting ground and now a popular watering-place (incorporated in 1879); on the northeast shore of Martha's Vineyard, Dukes co., Mass. (for location of county, see map of Massachusetts, ref. 6–J); 22 miles S. E. of New Bedford, 60 miles from Boston. Pop. (1880) 672; (1890) 1,080; (1900) 1,100.

Editor of "Martha's Vineyard Herald."

Cottar: See Crofters.

Cott'bus, or **Kottbus**: a town of Prussia; in Brandenburg; on the river Spree; 67 miles S. S. E. of Berlin, with which it is connected by a railway (see map of German Empire, ref. 4–G). It is inclosed by walls, and has a royal palace and a gymnasium; also manufactures of woolen cloths, linen goods, hosiery, tobacco, etc. Pop. (1890) 34,909.

Cottereau, Jean: See Chouans.

Cot'tidæ [from Cottus (*q. v.*), the typical genus + the patronymic ending idæ]: a family of spiny-rayed fishes characterized by the bony cheeks, short first dorsal, and more or less spiny head. It contains the "miller's thumb," sea-bullhead, sculpin, fatherlasher, and other fishes, most of which are of rather repulsive appearance. The species are very numerous, and are confined to the rivers and seas of the north. They are not much valued as food.

Revised by F. A. Lucas.

Cotting, John Ruggles, M. D., LL. D.: Congregational minister; b. in Acton, Mass., in 1787; educated at Amherst,

Dartmouth, and Cambridge. Dr. Cotting acquired reputation by his publications in chemistry and geology, and by an agricultural survey in Georgia. He was the author of an *Introduction to Chemistry* (1822) and a *Synopsis of Lectures on Geology* (1825). He held professorships in Amherst College and at Pittsfield Medical School. D. Oct. 13, 1867, near Milledgeville, Ga., where he had spent the last thirty years of his life. Revised by GEORGE P. FISHER.

Cotton: a soft, downy fiber which surrounds the seeds in the capsules or bolls of plants of the genus *Gossypium* and order *Malvaceæ*. The species are numerous, but only three are important, viz.: *Gossypium herbaceum*, or *Gossypium album*, called also short-staple upland, woolly-seeded, and green-seeded. This is the species generally cultivated. Varieties of it have been multiplied by selection and by special cultivation, and by hybridizing with *Gossypium barbadense* or *G. nigrum*, known also as sea-island, long staple, or black-seeded cotton. The cultivation of the latter is confined principally to soils bathed in a salt atmosphere. It reaches its highest perfection along the coast of South Carolina, Georgia, Florida, and in Egypt. Both these species are annuals. *Gossypium arboreum*, or tree-cotton, a perennial species, grows in South America and Africa. It is inferior to the annuals both in yield and quality of fiber. All the species of the cotton-plant originated in the tropics, a fact which the cultivator must constantly bear in mind. Like the sunflower, it turns its leaves to the morning and evening sun. Though a tropical plant, it is most successfully cultivated in the temperate zone. The climatic conditions favorable to its best development are six months' exemption from frost, a well-distributed, moderate rainfall during the period of growth, with little rain and abundant sunshine while maturing. These are best supplied in the southern tier of the North American States, which have no competitor except Egypt in the quantity or quality of fiber produced.

Cotton-plant.

While the cotton-plant is cultivated chiefly for the fiber, which grows upon the seed, the seed itself has become commercially valuable, and the fiber from the inner bark, little inferior to and resembling that of jute, also has possibilities of commercial importance.

The flower of *G. barbadense* is of a rich cream color; that of *G. herbaceum* a pure white when first open, changing to red the second day. The flower is bisexual and produces a capsule known as the "boll," which reaches maturity in six to seven weeks, when the surface contracting exposes the lint-covered seed ready for picking. This is done almost entirely by hand. A "harvester" recently invented attained partial success in 1891, a dry autumn. This gathers leaves, bolls, and small stems, from which the lint is afterward separated by machinery made for the purpose. Originally, the cotton-gin was an apparatus in which the cotton was passed between two rollers revolving in opposite directions. This, the "roller-gin," is still used for ginning sea-island or black-seeded cotton, which is quite easily freed from its seeds. But green-seeded, upland, or short-staple cotton, the species most generally grown, can not be ginned by such simple means. The lint of the woolly seeded varieties is separated from the seed by means of the saw-gin, invented in 1793 by Eli Whitney, a native of Massachusetts. This consists essentially of a cylinder composed of fifty to eighty steel disks, the edges of which are sharply serrated. These saws *cut* the lint from the seed while revolving with great velocity. The lint is taken from the saw-teeth by another cylinder called the "brush," and conveyed to the "condenser." The lint is then packed into bales weighing 450 to 500 lb. each. Formerly the bales weighed only 300 lb., and were long and round and packed by hand, as wool and the sea-island cotton are still packed. Sea-island cotton is separated from the seed, to which it adheres but feebly, by the roller-gin, which pulls rather than cuts the lint from the seed. In this species the lint separates readily and entirely from the seeds, leaving them sleek and black. A part of the lint adheres to the seed of the upland cotton. These are reginned, before extracting the oil, and yield about 35 lb. of short lint to the ton of seed. This is used for wadding, batting, and other purposes for which inferior grades of cotton are used. The seed is then decorticated, the hulls constituting by weight one-half of the seed; the meats, or kernels, are then steamed, sacked, and the oil expressed, yielding 30 to 35 gal. of crude oil to the ton of seed. The cake is dried and ground, yielding about 700 lb. of meal per ton of seed.

The refined oil is used in a great many ways, such as in the manufacture of substitutes for butter and standard lard; for oiling machinery, dressing morocco, mixing with other oils for the preparation of paints, and after a voyage to Europe returns as fancy brands of "olive" oil. See COTTONSEED OIL.

The meal is extensively employed as a source of nitrogen in the preparation of commercial fertilizers. It is also used directly as a fertilizer, and for feeding stock. Large quantities are shipped to the Northern U. S. and to Europe as food for cattle. The meal and hulls are fed to cattle without other provender with satisfactory results, both as regards "economy" and as regards the production of flesh and fat.

The cotton-plant is subject to the attack of injurious insects and fungi. The larva of *Aletia*, the cotton caterpillar, is no longer dreaded as formerly, since the means of destroying this pest with "Paris-green" is within the reach of the most humble planter. Means of destroying the "boll-worm," which is very destructive in some seasons, by puncturing the young bolls or capsules, have not yet been devised. No satisfactory preventives of the attack of several very destructive fungi have been discovered.

The experiments conducted at the experiment stations in the cotton States have materially improved the methods of cultivation and contributed to economy in fertilization.

The introduction of commercial fertilizers has extended the area of profitable cotton-culture about 50 miles farther north than formerly, in consequence of their effects in hastening the maturity of the plant. Their use has also improved the quality of the lint, by giving it greater length and strength, and by hastening maturity has enabled the planter to harvest the crop at less cost and in better condition.

The early history both of the culture and the manufacture of cotton is obscure. It seems to be generally admitted that India took the initiative in both, and attained a skill in the latter which was never equaled elsewhere previous to the invention of machinery for its manufacture. Early in the sixteenth century—about 1521—the cotton-plant was cultivated for its flowers in Talbot co., Md. Small patches were grown in Virginia and adjacent States prior to and after the war of the Revolution, the lint being picked from the seed by hand, the thread spun, and the cloth for domestic use woven on the farms.

The saw-gin, even in its earliest history, had a capacity equal to that of 3,000 pairs of hands in separating the lint from the seed.

The Southern U. S., British India, Egypt, and Brazil produce practically the cotton-supply of the world. India ranks next to the U. S. in quantity produced, but in quality of lint her product is inferior. Not only are the soil and

climatic conditions of the Southern U. S. superior to those in any other part of the globe, but the plant has received more intelligent cultivation there than elsewhere. The yield in these States ranges from one-fourth of a bale of 500 lb. to two bales per acre. To produce two bales would require a yield of 3,000 lb. of seed-cotton, one-third of which would be lint—1,000 lb. of lint and 2,000 lb. of seed.

If the lint only is removed from the land, cotton is the least exhausting of the crops cultivated in the U. S. An average crop removes in the lint only 2·75 lb. of nitrogen, phosphoric acid, potash, lime, and magnesia per acre, while a crop of 10 bush. of wheat per acre removes 32·36 lb. of the same elements of plant-food. See COTTON MANUFACTURES.

J. S. NEWMAN.

Cotton, CHARLES: English poet; b. Apr. 28, 1630. His poems were chiefly parodies and humorous pieces, and include travesties of Vergil and Lucian, and a local description —*The Wonders of the Peak* (1681). He translated Montaigne's essays, and contributed a treatise on trout-fishing to the *Complete Angler* of Izaak Walton. D. in 1687.

H. A. B.

Cotton, JOHN: Puritan minister; b. at Derby, England, Dec. 4, 1585; educated at Cambridge; preached over twenty years at Boston in England, but, incurring Laud's displeasure, fled to Massachusetts in 1633; was pastor of the First church in Boston (organized in 1630), and acquired such influence that he was called the patriarch of New England. He opposed Anne Hutchinson and Roger Williams. He wrote nearly fifty books, all of which were published in London. D. Dec. 23, 1652.

Cotton, Sir ROBERT BRUCE: English antiquary; b. in Denton, Huntingdonshire, Jan. 22, 1571; educated at Westminster School and at Jesus College, Cambridge (B. A. 1585); formed valuable collections of books, manuscripts, coins, etc.; was knighted 1603; created baronet 1611. D. May 6, 1631. The Cottonian library was bestowed on the nation by his great-grandson, Sir John; was first removed to Ashburnham House, Westminster, in 1730, and, after suffering from fire in 1731, was finally placed in the British Museum in 1753.

Cotton-gin: a machine for freeing cotton from its seeds, which adhere to the fiber with considerable tenacity. See COTTON and COTTON MANUFACTURES.

Cotton Manufactures: textile fabrics composed of cotton and the processes by which they are produced. The fiber of the cotton-plant is well adapted for the production of yarn or thread, and thus for employment in the fabrication of woven cloth. Each fiber if left to itself acquires a twist which adds to its tensile strength; and it is by twisting many fibers of cotton around one another that the strength necessary to its usefulness as the material of a textile fabric is imparted to it. The spinning of cotton yarn and the manufacture of coarse cotton cloth have been practiced in many parts of the world from a period of remote antiquity. The arts were established in Egypt, India, and China centuries before the Christian era. They are found to be practiced by some tribes of Central Africa who have only lately been brought in contact with modern civilization. They were known to the nations of Mexico, Yucatan, and Peru long before the Spanish conquests in the sixteenth century. But the application of machinery to the preparation, the spinning, and the weaving of cotton dates back little more than a hundred years. In the homes of its origin the manufacture has remained to a certain extent what it has always been—a handicraft in which human labor availed itself of none but the rudest implements. The enterprise of modern commerce carries the cheap product of modern machinery to ever more remote corners of the earth, and will soon render extinct the hand-spun and clumsily woven cloth of the native. The development of the cotton manufacture began with the last process in the making of cloth, and the cycle of fundamental improvements was completed by the invention of a device for removing the seed from the raw material as it comes from the field. The fly-shuttle was invented about 1750. By means of this improvement the efficiency of the hand-loom was much increased. About ten years later James Hargreaves, an illiterate Lancashire weaver, made an invention for the carding of cotton, which was quickly improved by another unknown inventor, and thus the principle of the carding-machine of to-day was introduced. In 1767 Hargreaves invented the spinning jenny, by which he was enabled to produce eight threads at once. In this machine we find partially developed the principles which are fully exemplified in the mule. Richard Arkwright patented in 1769 a spinning frame, or "throstle," called at first a "water-frame," the chief and most useful novelty in which was a device for spinning with rollers. The "roving," or slightly twisted material, passing between two pairs of rollers, the forward pair revolving at a much higher speed than those behind, draw out the roving, and make it finer and more regular before it receives the final twist which converts it into yarn. Arkwright adopted in this machine the principle now known as the flyer, by which the yarn is twisted and wound upon the bobbin at the same time. Samuel Crompton in 1779 combined the ideas of Hargreaves and Arkwright in the mule jenny. In 1785 Dr. Edward Cartwright, a clergyman, invented the power-loom. Two things remained to render possible the gigantic expansion of the cotton industry which this century has witnessed —a quick and inexpensive method of separating the fiber from the seed, which up to that time had been a slow and laborious process, and a new mechanical force to drive machinery at a high speed. The cotton-gin of Eli Whitney supplied the first, and the steam-engine the second, taking them in the order here mentioned; but the first steam-engine set up in a cotton-mill, in 1785, antedated by seven years the great invention which made possible the production on a large scale of cotton in a condition fit for manufacture. The progress made in machinery during the nineteenth century has been rapid, and has resulted both in an enormous saving of labor and in a most wonderful increase in the product resulting from a given expenditure of power. For example, the speed of the spindles used on Arkwright's "water-frame," so called because it was usually driven by water-power, was but 3,000 or 4,000 turns a minute, whereas the speed of a modern spindle is fully 9,000 turns. In no other industry does the keenness of competition require so extensive and so frequent changes of machinery to keep a factory up to the requirements of the times. Improvements are made constantly, and old machinery must be replaced with new long before it has worn out. The chief processes in spinning are directed to the following objects: (*a*) opening and cleaning; (*b*) laying the fibers straight and parallel; (*c*) making the continuous bundle of fibers which is to form the yarn exactly even in size and strength; (*d*) drawing the "sliver"—the bundle of fibers just mentioned—down to the required size, when it is known as roving; (*e*) giving the roving the necessary twist and winding it upon the bobbin. The first machine is the opener, or picker. Loose cotton from the bale is fed into this machine evenly, and is subjected to the action of a beater. This machine separates dust and other impurities from the cotton, which is delivered at the end of the machine in a uniform layer, called a lap. A lapping-machine comes next. It is fed with three laps at once, and the three layers are drawn out to the thickness of one. The object is to neutralize the irregularities of each lap by averaging them with the irregularities of two others. It may be remarked that this principle of doubling and drawing for the purpose of reducing irregularities is followed at every step of the process down to the spindle. After the lapping-machine the cotton goes to the card, by which the fibers are first laid exactly parallel to each other, in a thin, gauzy film, upon teeth covering a cylinder, and then stripped off by a vibrating comb, and drawn together in what may be called a flat, untwisted rope. The strands are next doubled and drawn in a drawing frame. In the manufacture of sewing cotton, however, and in the production of fine yarns for weaving, there is an intermediate process, the combing, by which the short staple is removed; and in the manufacture of all fine yarns the "sliver," as the product of the carding and combing machines is called, passes several times through the drawing frame. There are next three machines, known as the "slubbing frame," the "intermediate frame," and the "roving frame," through each of which the sliver passes, being in each drawn out and slightly twisted. It has now become "roving," a soft, light twisted cord, and it passes to the last process, the spinning. The improvements in spinning during recent years have been numerous and important. The superiority of the modern automatic mule over the flyer frame for spinning fine yarns was so great that it superseded frame-spinning to a large extent, particularly in England, where a large part of the yarn produced is yarn of high counts, which is ultimately to be loaded with "sizing," and thus increased in weight but not in strength. But the invention of the "ring frame," in which the work formerly done by the "flyer" is performed by passing the yarn through a bit of curved wire, known as a "traveler,"

which moves around the spindle on a ring, has revolutionized spinning. The spindle itself has been meanwhile greatly improved. Inasmuch as the production of yarn is substantially in proportion to the speed of the spindle, it follows that the new spindles are much more economical as well as more efficient. For the modern spindles make 9,000 turns a minute—as against a maximum of 7,500 turns only so lately as 1870—and they run so much more easily that the same power moves 25 per cent. more of them at the higher speed than of the old ring spindles at the lower speed. All the fundamental improvements of the ring frame and of the ring spindle are of U. S. origin, and the reintroduction of frame-spinning has made much greater progress in the U. S. than it has elsewhere. By far the largest part of the yarn spun is woven into plain cotton cloth; but considerable amounts are sold for use as warps in woolen and worsted goods, or for knitting into underwear; and a large part of the produce of sea-island cotton, after being spun into yarn, is converted, by doubling and twisting, into sewing thread. In the U. S. the whole manufacture, from raw cotton to woven cloth, or to sewing thread, and sometimes from raw cotton and wool to the condition of woven mixed textiles, is ordinarily carried on by one and the same establishment. In Great Britain and on the continent of Europe spinning and weaving are almost universally separated. See Loom and Weaving.

Cotton manufacture has its chief seat in Great Britain. In 1787 the total importation of raw cotton into Great Britain was 22,800,000 lb. In 1890 the amount consumed in the mills of the United Kingdom was 1,656,000,000 lb., and the value of cotton goods exported reached the enormous amount of £74,400,000. Of late years the expansion of the cotton industry on the continent of Europe and in India has been much more rapid than it has been in Great Britain. The number of spindles in operation in 1875 and in 1890 is shown by the following:

COUNTRIES.	1875.	1890.
Great Britain	39,000,000	43,750,000
Continent of Europe	19,440,000	24,575,000
India	1,100,000	3,270,000
United States	9,500,000	14,188,103

The first successful cotton-factory in the U. S. was that of Samuel Slater, established at Pawtucket, R. I., in 1790. For many years the progress was slow. In 1810 the whole consumption of cotton in the country was no more than 10,000 bales. The consumption reached 90,000 bales in 1815, the war of 1812 having cut off foreign manufactures and compelled the production of goods at home. Under the stimulus of favoring legislation the increase was rapid. But the greatest development has been in the last half of the nineteenth century. The total value of all products of the cotton manufacture, according to the census, beginning with 1840, has been as follows:

1840	$46,350,453	1870	$177,489,739
1850	61,869,184	1880	210,950,383
1860	115,137,926	1890	267,981,724

Inasmuch as this increase in gross value has been accompanied by a steady and a very great reduction in the average price of yarns and cloth, the actual growth of the industry has been vastly larger than is indicated by the figures above given. The magnitude of the manufacture is fully exhibited by the following facts obtained by the census of 1890:

Number of spindles	14,188,103
Number of looms	324,866
Bales of cotton consumed	2,228,347
Pounds of cotton consumed	1,193,584,641
Square yards of woven goods produced	3,002,761,037
Total value of product	$267,981,724
Capital employed in the industry	$354,020,843

NUMBER OF PERSONS EMPLOYED AND AMOUNT OF WAGES PAID.

Men	88,837	Wages	$33,797,517
Women	106,607	"	29,165,086
Children	23,432	"	3,061,935
Officers and clerks	2,709	"	3,464,734
Total	221,585	Total	$69,489,272

The chief seat of cotton manufacturing in the U. S. is New England, which according to the census of 1890 contained 76 per cent. of all the spindles in the country—a ratio which has remained nearly constant during the whole history of the manufacture. Among the States of New England, Massachusetts is very far in the lead. In 1890 it had 41 per cent. of all the spindles in the U. S. The greatest concentration of the manufacture is in the city of Fall River, Mass. The two adjoining counties of Bristol, in Massachusetts (in which Fall River is situated), and Providence, in Rhode Island, contain 30 per cent. of all the spindles in the U. S. The decade from 1880 to 1890 witnessed an extraordinary growth of the cotton manufacture in the Southern States, particularly in North Carolina, South Carolina, and Georgia. The number of spindles in the Southern States increased threefold during the ten years.

Edward Stanwood.

Cottonseed Oil: an oil obtained from the cotton-plant, *Gossypium barbadense*, *herbaceum*, and allied species. The bolls of the plant contain cotton fiber and seed in the proportion of 1 of fiber to 2½ or 3 parts by weight of seed. The average percentage of oil is put at 15 to 20, while 25 per cent. is regarded as high.

Although the cotton-plant has been cultivated for over a thousand years, no use has been made of its products, except the cotton-fiber, until comparatively recently. It has been found that the fiber of the plant-stalk can be made into a coarse bagging, that the root is susceptible of use in dyeing and pharmacy, and that the seeds will yield as a principal product the oil, besides several valuable by-products. In 1861 it was asserted by Mr. Edward Atkinson that the cotton-plant would be a valuable plant for cultivation, even if it produced no cotton. In the preparation of the oil two difficulties presented themselves; the "lint," or short fiber surrounding the seed, retained much of the oil when the seed was crushed and pressed, and the oil, after expression, had a strong color. In 1785 the Society for Encouragement of Arts and Commerce offered a prize for the manufacture of cottonseed oil on a commercial scale. At the British Exhibition of 1851, Burn, of Edinburgh, and De Géminy, of Marseilles, exhibited specimens of cottonseed oil and cake, for which prizes were awarded. In 1852 cottonseed oil was exported from Egypt to France. The first attempts in the U. S. to extract the oil as a merchantable product were made at Natchez, Miss., in 1834, but both those experiments and others made in 1847 at New Orleans, La., were unsuccessful. In 1855 the decorticating machine of L. Klapp was introduced, by which the hulls were separated from the kernels; and since that time the industry has grown rapidly.

Manufacture of Cottonseed Oil.—The "lint" is usually removed by one or more additional ginnings. The clean seed is passed through a hulling or decorticating machine. The kernels are then crushed between iron rollers, when they are ready for pressing. Hydraulic pressure is used, the intensity being 250 to 500 lb. per square inch. Fifteen to 20 per cent. of "crude" cottonseed oil is thus obtained. This product is thick and turbid, has a deep brown-red color, and deposits a slimy sediment on standing. The oil is refined by agitation with dilute alkaline lye (containing 3 to 4 per cent. of potash or soda), heating, and allowing it to stand, when the lye, carrying the impurities, settles to the bottom, constituting what is known as "cotton-oil soap stock," while the clear golden-yellow oil is drawn off from the top. In some cases this treatment is repeated, a lye still more dilute being used. Processes involving heating with milk of lime or with oil of vitriol, either alone or with bichromate of potash, or simply steaming, have also been used in clarifying the oil, while some have recommended or used bleaching-powder or nitric acid and chlorate of potash to improve the color of the oil. By these processes of refining the oil loses about 10 to 15 per cent. of its weight.

The grades of oil found in U. S. markets are crude oil, summer yellow and summer white oil, winter yellow and winter white oil. By cooling the summer oils to the freezing-point the palmitin (called by the manufacturers "stearin") crystallizes out, and the oil separated by pressing the solidified material constitutes the "winter oils."

Properties.—Cottonseed oil (Mod. Lat. *Oleum gossypii*, Fr. *huile de coton*, Germ. *Baumwollensamenöl*, *Baumwollensaatöl*) consists chiefly of palmitin and olein. It contains about 1·85 per cent. of a non-saponifiable hydrocarbon. The winter oils consist almost entirely of olein. The elementary composition is given as—

Carbon	76·4 per cent.
Hydrogen	11·4 "
Oxygen	12·2 "
Specific gravity at 60° F.	0·922 to 0·930 "

It solidifies at about 32° F. or a little above. The removal of the palmitin in the preparation of the winter oils slightly

reduces the gravity and materially lowers the solidifying point. The refined oil is almost odorless and has a slight nutty flavor. The fluidity of the crude oil is 28 to 30 times less than that of water; of the refined oil, about 17 times less (Adriani). The oil is insoluble in alcohol, but very soluble in ether, chloroform, etc. With nitric acid and copper-turnings (elaïdin test) the oil assumes a reddish or brownish yellow color, and, after standing for some time (twelve to twenty-four hours), becomes very thick and viscid. With strong sulphuric acid a dark-colored mixture forms, which, after heating, is soluble in water. With potash or soda lye the oil does not readily or rapidly saponify, but after saponification the mass assumes a bluish tint on exposure to the air. By treating the saponified mass with sulphuric acid a blue-black compound may be obtained, which can be used as a dye, "cottonseed blue" ($C_{17}H_{24}O_4$). Nitrate of silver is but slightly reduced by the oil. Heated with chloride of zinc it turns brown.

Cottonseed oil stands midway between the drying and the non-drying oils. By some it is classified with the one; by others with the other. It has some drying properties, but in this respect is far inferior to linseed oil.

Uses.—Cottonseed oil is used as an adulterant or as a substitute for various oils, such as linseed, sperm, lard, olive, and almond oil, etc. It is extensively used in cooking as a substitute for butter or lard in the U. S. and it appears to be growing in favor. It also finds application in treating leather, in dressing wool, and as a lubricator and an illuminant, as well as in soap-making. Its use in pharmacy has been strongly recommended (Weatherby). It has been stated that nine-tenths of all of the "salad oil" consumed in the U. S. consists of cottonseed oil. In 1881–82 the Italian Government put a high import duty upon cottonseed oil, evidently with the intention of thereby preventing the adulteration of olive oil. It is, however, asserted that this action of the Government has failed of its purpose, since the adulteration is still practiced, oils from other seeds and from nuts being used. Some division of opinion exists as to the advantages derivable from an admixture of cottonseed oil with linseed in paints. Some assert that it affords a more elastic coat, which will not crack; others, that the drying properties are very feeble, and that it is admissible only in the inferior grades of paints and varnishes.

By-products in the manufacture of cottonseed oil:

One hundred lb. of cotton seed will afford—

Lint and hulls	40 to 46 lb.
Cottonseed cake	37 to 38 "
Crude oil	14 to 16 "

Next to the oil, the cake is the most important product. Frequent examinations have been made of the cake, with a view to its utilization. The percentage composition has been found to be about as follows:

COMPONENT PARTS.	From whole seed.	From hulled seed.
Moisture	12	9
Albuminoids	21	43
Oil	7	15
Crude fiber	23	4
Other organic constituents	29	22
Mineral matter (ash)	8	7
Totals	100	100

Phosphoric acid constitutes about one-third of the mineral matter present. The composition is somewhat variable, depending on the quality of seed used, the perfection of the machinery used in extracting the oil, etc.; so that for nearly all the constituents the variation may be 2 to 3 per cent. above or below the figures here given. In Marseilles the cake is extracted with bisulphide of carbon, the oil thus obtained affording, when saponified, a greenish soap which is highly prized. A large proportion of the cottonseed cake produced is, however, used as fodder for cattle, while a not inconsiderable proportion is used as a fertilizer. Experiments with the ground cake ("cottonseed meal") as a packing for the axle-boxes of railway cars, etc., have proved it to be an efficient and economical substitute for cotton-waste saturated with oil for such purposes.

As a fodder, it has been found that 74 per cent. of the albuminoids, 91 per cent. of the fat and oil, and 46 per cent. of the non-nitrogenous material are digestible. Cows fed with the meal show an improvement in the quantity and quality of their milk, while the beef from such cattle is excellent in quality. The droppings from stock fed with it constitute a valuable manure. It is, however, claimed that the effect of feeding pregnant cows with cottonseed meal is to produce miscarriage or abortion.

With regard to the other by-products of the cotton-seed oil manufacture, the lint is used in the manufacture of paper of excellent quality; the hulls are used for fuel, or are ground in with the meal for fodder (some stock-raisers prefer a fair proportion of hulls in the feed for their stock); the residues from the clarifying of the oil ("cotton-oil soap stock"), palmitin, etc., are used in the manufacture of soap.

The average yield of seed is 2 lb. to each pound of lint or merchantable cotton. In the U. S. in 1893, 1,100,000 tons of cottonseed were crushed by the cottonseed-oil mills, yielding 45,000,000 gal. of crude cottonseed-oil, of which 11,131,560 gal. were exported. In 1900, 46,902,390 gal. were exported, valued at $14, 127,538.

Assuming that the average total production of American cotton for several years past was 8,000,000 bales, of 475 lb. each, this would indicate a total annual yield of 7,600,000,000 lb., or 3,800,000 tons of seed. About one-fourth of these would be required for planting seed, leaving 2,850,000 tons for other purposes. This surplus amount of seed would divide into valuable products as follows:

Crude oil, gallons	116,850,000 =	$23,370,000
Cake, in tons	997,500 =	19,950,000
"Linters," in tons	35,625 =	2,137,500
Hulls, in tons	1,102,500 =	5,512,500
Total values		$50,970,000

These figures represent the value of the surplus cottonseed—a product hardly considered of commercial importance until within the last quarter of a century.

LITERATURE.—For further information regarding the properties and uses of products from cottonseed see the article BUTTER, ARTIFICIAL, in this cyclopædia, and A. Adriani, *On Cottonseed Oil* (*Chem. News*, xi., 1865, 5); W. H. Weatherby, *Cottonseed Oil* (*Am. J. Pharm.*, 1861, 208); R. Reynolds, *Pharm. Jour. and Trans.* (2), vii., 226; *The Chemistry of Artificial Light* (London, 1859, p. 61); A. H. Allen, *Commercial Organic Analysis*, ii., pp. 130, 144, 191; Watt's *Dictionary*, vol. iv., pp. 180, 181, and 3d Sup., ii., p. 1427; *Report of Conn. Agricultural Exp. Station 1879*, p. 145; Theodore Chateau, *Guide pratique*, etc., *Corps gras Industriels*, p. 161 (Paris, 1864); Adolphe Renard, *Corps gras, Huiles graisses*, etc., p. 25 (Rouen, 1880); H. Perutz, *Die Industrie der Fette und Oele*, p. 28 (Berlin, 1866); Dr. C. Deite, *Die Darstellung der Seifen*, etc., p. 72 (Brunswick, 1867); Dr. C. Deite, *Die Industrie der Fette*, p. 168 (Brunswick, 1878); Louis E. Andés, *Die Trocknenden Oele*, p. 51 (Brunswick, 1882); Dr. Carl Schaedler, *Die Technologie der Fette und Oele* (Berlin, 1890); Fehling's *Handwörterbuch*, i.

Revised by IRA REMSEN.

Cotton States and International Exposition: See EXPOSITION, COTTON STATES, etc., in the Appendix to Vol. IV.

Cot'tonwood-tree: the *Populus monilifera*, a species of poplar which grows on the margins of streams of the Western U. S. to the height of 80 to 100 feet or more. The timber is soft and not very valuable. Several other Western species of *Populus* are commonly called cottonwood.

Cotton-worm: the caterpillar of an owlet moth, *Aletia xylina* (Say); in some years very destructive to the cotton crop of the U. S. and of Central and South America. It is an inch and a half long, green, with light-yellow stripes and black dots along the back; has sixteen legs, and is a semi-looper. It hatches in from one to two weeks from eggs deposited on the under side of the leaf of the cotton-plant. The moth is of buff color, and about an inch long.

Cot'tus [from Gr. κόττος, a kind of fish]: a genus of fresh-water fishes of the family *Cottidæ*, containing the "miller's thumb," blob, or bullhead, numerous species of which abound in the cold rivers of northern regions. They lie on the bottom among rocks, darting suddenly when frightened or in pursuit of prey, and are very destructive to the eggs of trout.

Cotyle'don [from Gr. κοτυληδών, cup-shaped hollow, from κοτύλη, anything hollow]: the first leaf of a little plant as it emerges from the seed. The first formed leaves are simpler and cruder structures than those which follow, and the early botanists, who, ignorant of their nature, did not regard them as leaves, gave them this special name, which is still retained. In some plants even the first leaves are alternate upon the stem, so that there is a single leaf at the beginning, or as we say there is but one cotyledon, and the plant is monocotyledonous; in other cases the earlier leaves are in pairs, and the plant is dicotyledonous.

It happens that these distinctions are accompanied by others which are more profound, and hence we have two

A, young bean with its two cotyledons (*c*); B, young squash with its two cotyledons (*c*); C, oat grain germinating, the single cotyledon at *c*; D, a monocotyledonous embryo with very large cotyledon (*c*); E, same in section.

groups of the higher flowering plants bearing the names Monocotyledons and Dicotyledons (*qq. v.*).

Charles E. Bessey.

Couch, Darius Nash: U. S. military officer; b. July 23, 1822, in Putnam co., N. Y.; graduated at West Point in 1846; served in the war with Mexico 1847–48; and in Florida hostilities 1849–50; resigned Apr. 30, 1855; entered the civil war as colonel of the Seventh Massachusetts Volunteers; and July 4, 1862, became major-general U. S. volunteers: in command of the department of the Susquehanna 1863–64, engaged in defense of Chambersburg, which was evacuated; and in command of a division of the Twenty-third Corps 1864–65, engaged in the battle of Nashville, and operations in North Carolina. Resigned May 26, 1865, from volunteer service. He was the Democratic candidate for Governor of Massachusetts in 1865; U. S. collector for port of Boston 1866–67; quartermaster-general of Connecticut 1877–78, and adjutant-general 1883–84. D. Feb. 12, 1897.

Couchant [pres. ptc. of Fr. *coucher*, lay down, lie down < O. Fr. *colchier*: Ital. *collocare* < Lat. *colloca're*]: in heraldry, lying down, with head raised; distinguished from *dormant*, where the head is down.

Coudert, Frederick R.: See the Appendix.

Cou'dersport: borough; capital of Potter co., Pa. (for location of county, see map of Pennsylvania, ref. 2–E); on Coudersport and Port All. R. R., 17 miles from Port Allegheny; has a tannery, a foundry, several mills, a public library, and graded schools. Pop. (1890) 1,530; (1900) 3,217.

Coues, Elliott, M. D.: naturalist; b. in Portsmouth, N. H., Sept. 9, 1842; graduated from Columbian University, Washington, D. C., in 1861, and subsequently received the degrees of A. M., M. D., and Ph. D. (honorary) from the same institution. He entered the U. S. army as a medical cadet in 1862; from 1863–81 was assistant surgeon, and during that period was brevcted captain for services during the civil war. In 1866 he was post-surgeon at Columbia, S. C.; in 1869 became Professor of Zoölogy and Comparative Anatomy at Norwich University, Vt.; from 1873–76 was surgeon and naturalist to the U. S. northern boundary commission, serving also in 1875 as collaborator at the Smithsonian Institution: from 1877–83 Professor of Anatomy in the medical department of Columbian University; appointed Professor of Biology in the Virginia Agricultural and Mechanical College; is now connected with the Smithsonian Institution. His publications on scientific subjects, especially in the departments of ornithology and mammalogy, are very numerous, and include *Key to North American Birds* (Boston, 1872); *New Key to North American Birds* (1884; 3d ed. 1892); *Field Ornithology* (Salem, 1874); *Birds of the Northwest* (Boston, 1874); *Fur-bearing Animals* (1877); *Monographs of North American Rodentia*, with J. A. Allen (Washington, 1877); *Birds of the Colorado Valley* (1878); *Ornithological Bibliography* (1878–80); *New England Bird Life*, with R. E. C. Stearns (1881); *Check-list and Dictionary of North American Birds* (Boston, 1882); *Air-Fauna Columbiana*, with D. W. Prentiss (1883); *Our Native Birds* (1885). Among other works are *Biogen, a Speculation on the Origin and Nature of Life* (Boston, 1884); *The Dæmon of Darwin* (1884); *A Woman in the Case*, an address (Washington, 1887). Dr. Coues was associate editor of *The American Naturalist*, *The Auk*, and other periodicals, and editor of the departments of general zoölogy, biology, and comparative anatomy of the *Century Dictionary*. He was a member of many scientific societies in the U. S. and Europe, and was one of the founders of the American Ornithologists' Union. He was actively interested in the theosophist movement in the U. S., and was president of the American board of control of the Theosophical Society of India. D. in Baltimore, Dec. 25, 1899.

Cougar: See Puma.

Cough: a sudden inspiration, followed by closure of the glottis, and a sudden expiration, causing a strong current of air to sweep through the air-passages and out of the mouth. Cough may be due to irritation of foreign particles or gases, or of diseased secretions in the larynx, trachea, or bronchi, and tends to remove these. The act is more or less reflex and involuntary, and may become excessive if the mucous surfaces are abnormally sensitive, or if the general nervous system of the patient be excitable. Disease of the bronchial tubes—bronchitis—is the most frequent cause, and in many other diseased conditions of the lungs the associated bronchitis is the real cause of the cough. Certain diseases quite distant from the lungs, however, may cause this symptom, especially in children, as inflammations in the nose, with swelling of its mucous membrane, enlargements of the tonsils and irritation elsewhere in the pharynx, and occasionally abdominal diseases. A persistent cough is always regarded with dread, and may indeed be the only symptom of consumption for long periods of time. Of especial significance is persistent slight cough in one of pronounced phthisical habit or hereditary tendency.

The *treatment* of cough varies largely with the cause. It is by no means necessary in every case to attempt to reduce its severity, since in many the act is conservative in tending to remove an irritant. When, however, the secretions are dry and tenacious, the cough is apt to become excessive without accomplishing any result in the way of removal of the irritant. In such cases mucilaginous drinks and sedatives, especially opium, do much good by reducing the cough. For the rest the treatment is directed entirely to the general disease and condition. Febrifuges for fever, expectorants, such as ammonium chloride, ipecac, and squill, to loosen the secretions and hasten their discharge, and tonics to increase the general strength, may all come into play.

William Pepper.

Coulomb, koo'lōn': in electricity, the practical unit of quantity. It is the quantity of electricity transferred per second by one ampère. The coulomb is $\frac{1}{10}$ of the absolute (C. G. S.) unit of quantity. It is named after Charles Augustine Coulomb (*q. v.*).

Coulomb, Charles Augustine: engineer and savant; b. in Angoulême, France, June 14, 1736. Coulomb was lieutenant of the corps of engineers, in which capacity he served for several years in the West Indies. He was a member of the French Academy and inspector-general of the university. He published many memoirs in the *Transactions of the Paris Academy of Sciences*. His most im-

portant works were in the domain of electricity and magnetism. D. in Paris, Aug. 23, 1806. See TORSION BALANCE.
E. L. NICHOLS.

Coulter, JOHN MERLE, Ph. D., LL. D.: American botanist; b. in Ningpo, China, Nov. 20, 1851; educated in Hanover College, Indiana, and Harvard University; botanist to Hayden Survey 1872–73; Professor of Natural Sciences, Hanover College 1874–79: Professor of Biology, Wabash College 1879–91; president Indiana State University 1891–93. His principal publications are *Synopsis of the Flora of Colorado*, with Thomas C. Porter (1874); *Manual of Rocky Mountain Botany* (1885); *Handbook of Plant Dissection*, with J. C. Arthur and C. R. Barnes (1886); *Manual of Texan Botany* (1892–93); and revisions of the families *Hypericaceæ*, *Umbelliferæ*, *Cornaceæ*, and *Cactaceæ*. Editor of *Botanical Gazette* (1875—). CHARLES E. BESSEY.

Council Bluffs: city; capital of Pottawattamie co., Ia. (for location of county, see map of Iowa, ref. 6–D); an important railway center, and the metropolis of Western Iowa. The city is built principally upon a plain at the base of the high bluffs where the councils of the Indian tribes were held, but not a few of the finest residences are to be found in the numerous "glens" which intersect the bluffs in every direction. The city is connected with Omaha by two iron railway and wagon bridges almost a mile in length, over which electric street cars and regular passenger and freight trains pass. Among the public buildings worthy of mention are the institution for the deaf and dumb, a large court-house, a U. S. post-office, and imposing school buildings. An electric railway connects the eastern, western, and southern extremes of Council Bluffs. Owing to its superior shipping facilities, it has become an important manufacturing center, and one of the chief distributing points for farming implements in the U. S. It is the center of a large fruit and gardening industry, and also has a large trade in horses. Steam-engines in large numbers, milling and mining machinery, planing-mills, agricultural implements of all kinds, cigars, cigar-boxes, and brooms are made here. In 1890 there were 128 establishments, and the value of products was $2,527,388. There are 1 daily and 2 weekly newspapers. Pop. (1880) 18,063; (1890) 21,474; (1900) 25,802.
EDITOR OF "NONPAREIL."

Council Grove: city; capital of Morris co., Kan. (for location of county, see map of Kansas, ref. 6–H); on Mo. Pac. and M., K. and T. R. Rs., on end of division of Mo. Pac., and both sides of the Neosho river; 25 miles from Emporia, in one of the most fertile valleys of the State. It was named by Kit Carson from the grove where councils for protection against the Indians were held, and is one of the oldest towns in the State. It has 7 churches and 6 schools; ships large quantities of grain, cattle, and hogs, and manufactures lime. Pop. (1880) 1,042; (1890), 2,211; (1900) 2,265.
EDITOR OF "REPUBLICAN."

Councilman, WILLIAM THOMAS, M. D.: b. Jan. 2, 1854, in Pikesville, Md.; educated at St. John's College and University of Maryland; assistant professor in Johns Hopkins University; at present (1901) Professor of Pathological Anatomy in Harvard Medical School. Author of *A Contribution to the Study of Inflammation* (1879); *Ueber fibrose Tuberkel* (1881); *Zur Ætiologie der Eiterung* (1883); *Neuere Untersuchungen über Lavaran's Organismus der Malaria* (1887); *On the Ætiology of Malaria* (1884); *On Arterio Sclerosis* (1890); *Syphilis of the Lungs* (1890); *Amœbic Dysentery* (together with D. H. A. Lafleur); articles on tumors in Buck's *Reference Handbook* (1886).

Councils, Œcumenical [from Gr. *οἰκουμένη* (*γῆ*), i. e. the habitable (world); because the whole Christian world is, in theory, assembled], otherwise called **General**, or **Universal, Councils**: certain great ecclesiastical assemblies, so called in distinction from diocesan, provincial, and national councils, which are more limited meetings of the same kind. The Greek and Latin Churches acknowledge seven councils—viz: (1) the first Council of Nice, 325 A. D.; (2) the first of Constantinople, 381 A. D.; (3) the first of Ephesus, 431 A. D.; (4) that of Chalcedon, 451 A. D.; (5) the second of Constantinople, 553 A. D.; (6) the third of Constantinople, 681 A. D.; (7) the second of Nicc, 787 A. D. To these the Roman Catholics add the following: (8) the fourth of Constantinople, 869 A. D.; (9) the first of Lateran, 1123; (10) the second of Lateran, 1139; (11) the third of Lateran, 1179; (12) the fourth of Lateran, 1215; (13) the first of Lyons, 1245: (14) the second of Lyons, 1274; (15) that of Vienne, in France, 1311; (16) that of Constance, 1414–18 (in part); (17) that of Basel, 1431–38; (18) the fifth Lateran, 1512–17; (19) that of Trent, 1545–63; and (20) that of the Vatican, 1869–70. The most important of these are noticed under their alphabetical heads. The great collection of documents upon these councils is that of G. D. Mansi, Florence and Venice, 1759–98, 31 vols.; the great history is by C. J. Hefele, Freiburg, 1855–90, 9 vols. (down to Trent).

Council of Seville, or **Casa de Contratación**: a board originally established in 1503 at Seville for the purpose of dispatching fleets to the Spanish colonies, of receiving vessels from the colonies, attending to the customs taxes and the royal treasure, and disposing of the results of trade or exploration. It also had authority to grant licenses for private exploration and traffic. Bishop Fonseca was at first at the head of it, and like the council of the Indies it may be said to have had its germs in the board of 1493, appointed to assist Columbus. Later the Casa de Contratación was subject to the council of the Indies, attending to its commercial business, and especially charged to maintain a strict monopoly of trade with the Indies for Spanish merchants.
HERBERT H. SMITH.

Council of the Indies: a Spanish tribunal; created by King Ferdinand in 1511 for the regulation of colonial affairs. When Columbus was preparing for his second voyage, in 1493, Juan Rodriguez de Fonseca was appointed to assist him, and to arrange any matters concerning the new discoveries. This man, afterward known as Bishop Fonseca, came to have great power in American affairs, and he was assisted by others, forming a kind of colonial board. Eventually it was merged into the council of the Indies. As its powers were enlarged by Charles V., this became a body of immense importance. "Its jurisdiction," says Bancroft, "extended to every department, civil, ecclesiastical, and commercial, with particular attention to the welfare of the Indians, and with the existing laws of Spain for guidance in framing *cedulas*, which together with royal decrees formed the laws for America. . . . By it viceroys and governors were made and unmade, also patriarchs and bishops, and even the pope had to submit for approval his bulls and briefs concerning the Indies." It was, besides, the supreme judicial court of Spanish America and the East Indies. The audiences were appointed by it, and appeals from them lay only to the council itself, and all the laws and ordinances of viceroys and governors were submitted to it for approval. It was subject only to the sovereign, who conferred with his ministers and with the council of Castile. The position of councilor of the Indies was a coveted distinction, and was frequently given to those who had served as viceroys.
HERBERT H. SMITH.

Council of War: a conference of military or naval officers, called by the commander-in-chief to advise him in relation to some important business or movement. The commandant of a garrison often solicits the opinion of a council of war before surrendering to the enemy. But in the end the military code leaves these matters to the discretion of the commander.

Counselor, or **Counsel**: in law, a person retained by a client to plead his case in a court of justice, or for legal advice or assistance. In Great Britain this term is applied specifically to those who have been admitted to plead to the bar (also called barristers and advocates), as distinguished from attorneys at law and solicitors. A counselor in Great Britain can maintain no action for his fees, the amount of which is optional with his client; all fees are expected to be paid when the briefs are delivered. He is not, however, liable to an action for negligence or lack of reasonable skill in his profession, as in the U. S. It is customary for a counselor to take instructions only through a solicitor; this is only a rule of etiquette and not a matter of law. See ATTORNEY, BARRISTER, and SOLICITOR. F. STURGES ALLEN.

Count [from O. Fr. *comte*: Ital. *conte* < Lat. *comes*, *comitis*, companion. In Germ. *Graf*]: a nobleman of an order of nobility inferior to dukes and marquises, but superior to viscounts and barons. Counts had anciently territorial jurisdiction, but at present they are simply noblemen having this hereditary title. The use of the word *comes* in this sense dates from the reign of the Roman emperor Augustus, who conferred it upon the senators who immediately surrounded him, and was afterward commonly applied to their companions by other Roman emperors. It was used in Spain about 650 A. D., and for a long period seems to have been of

equal dignity with that of duke, no distinction being made till 1297. In the British empire the title of earl is always used instead of count.

COUNTS-PALATINE were originally "officers of the imperial palace" in Germany, who possessed high judicial functions. The term was afterward applied to feudatories who had palatine jurisdiction (see PALATINE) over outlying territories, where they maintained a palace and the other machinery of a court. The term came still later to be applied as a title of honor by several princes, but is now obsolete.

Counterfeit [from O. Fr. *contrefait* < Lat. *contra*, opposite + *factus*, made]: that which is made in imitation of something else without legal authority and with a fraudulent intent, applied chiefly to spurious coin or bank-notes, or other factitious currency. The uttering of such coins or notes is a felony punishable by imprisonment, or even by death in some countries. To guard against counterfeiting, bank-notes are engraved with designs which can not be reproduced except at great expense. There are also secret marks and combinations of letters and figures known only to the proper authorities. A peculiar ink and paper are used, the manufacture or unlawful possession of which is made a criminal offense. Pamphlets called "detectors" are printed with lists and descriptions of counterfeit notes and coins. See FORGERY. Revised by F. STURGES ALLEN.

Counterfort (Fr. *contrefort*): in architecture, a buttress or pier built against or at right angles to a wall, to strengthen it and enable it to resist a particular thrust. In fortification a mass of stone or brickwork added to the revetment of a rampart in such a way as to form a buttress.

Counter-guard: an outwork designed to defend the two faces of a bastion or ravelin from a direct fire, so as to retard a breach being made. The counter-guard consists of two lines of rampart parallel to the faces of the bastion or ravelin, and separated from them by a narrow ditch.

Counter-irritants: a group of substances which are used for the purpose of producing local inflammation, generally upon the external surface of the body, in order that they may influence deep-seated inflammation or congestion. The *rationale* of their action consists in the reflex influence which may be exercised on central organs when irritation is applied to the surface of the body, causing contraction of congested or hyperæmic vessels in internal organs. Counter-irritants may be divided into several classes, namely: rubefacients, or substances which produce reddening of the skin, which exercise a fleeting influence; epispastics, which are so severe in their irritating powers as to produce blisters; and caustics, which actually destroy the tissues with which they come in contact, so that the irritation produced by them lasts for a very considerable period of time. The mild counter-irritant or rubefacient is the one which should be applied in cases where the congestion or inflammation of the internal organ is not marked, and where it is likely to last for a short time. The other measures are to be employed when the diseased condition is severe and where continued action is required. Thus no one would apply a caustic in the case of pain in the abdomen due to inflammation produced by eating bad food.

In the application of counter-irritants, they should never be applied to the area which is actually inflamed, but at some distance away from this area. Thus in cases of inflammation in the knee-joint the plaster should not be applied over the joint where the skin is reddened, but upon the healthy skin, either above or below the joint. It has also been learned by practical experience that where we desire to influence the eye by counter-irritation, the counter-irritant should be placed back of the ear or on the temple. Among the class of mild counter-irritants or rubefacients may be considered mustard, red pepper, and the spice plaster. The chief of the epispastics is cantharides, and of the caustics, which are at the present time very rarely used, caustic potash, caustic soda, and acid nitrate of mercury. H. A. HARE.

Counter-mark: in numismatics, a stamp often seen on ancient coins or medals; generally a figure or inscription. Some antiquaries suppose this mark was struck on money taken from an enemy.

Counterpart: a correspondent part, a copy, a duplicate. In law, when the parts of an indenture are interchangeably executed by the several parties, that part which is executed by the grantor is termed the *original*, and the others are *counterparts*. A counterpart is primary evidence against the party executing it. Revised by F. STURGES ALLEN.

Counterpoint (Fr. *contrepoint*: Ital. *contrapunto*): the art of writing music in several distinct parts. The name is derived from the circumstance of the notes being placed one against or over the other in the score. See MUSIC.

Counterpoise [Fr. *contrepoids*, i. e. that which "weighs against" something else]: a weight sufficient to balance another in the opposite scale; equal force or weight acting in opposition to something. In mechanics, a mass of metal connected with an instrument or machine, either for the purpose of giving steadiness or diminishing the pressure on some particular point.

Counter-proof: a print taken from print which has been taken from an engraved plate, and which is still fresh; the ink not yet dry. As this counter-proof is reversed from the first proof and corresponds with the engraving on the metal, it is a useful guide in retouching the latter.

Counterscarp: in fortification, the side of the ditch opposite the scarp. A *revetted* counterscarp is constituted usually by a wall of masonry called a counterscarp-wall; an *unrevetted* counterscarp is of earth at its natural slope.

Countersign: a watchword given daily by the commander of an army, in order that friends may be distinguished from enemies by their knowledge of it. Sentinels require every person who approaches their posts by night to give the countersign.

COUNTERSIGN is also the signature of a public officer or secretary to the charter of a king, or to any writing signed by the principal or superior, as a certificate that the charter or instrument is authentic.

County (Fr. *comté*): originally the territory of a count or earl. In modern usage it denotes a division of a state or kingdom. In England or Scotland the term is equivalent to shire. The term shire in England is not applied to those counties which were originally distinct sovereignties, such as Kent, Essex, Norfolk, Cumberland, and Sussex. Lancaster, Chester, and Durham are called counties palatine. (See PALATINE.) The primary divisions of the provinces of Ireland are called counties. Each State of the U. S., except Louisiana, is divided into counties, each of which contains a capital or county-town, in which the court-house is located. In Louisiana the divisions are called parishes, but are similar to counties.

Coup d'état, koo'dā'taa' [Fr., lit., a stroke of state]: a violent and illegal exercise of power on the part of a government for the purpose of establishing, increasing, or retaining authority. A *coup d'état* differs from a revolution in this important respect, that, whereas a revolution has for its purpose the overthrow or modification of the methods of a regularly organized and recognized government, a *coup d'état*, on the other hand, aims at a firmer establishment or increase of the authority already established. A revolution is the result of political action taken by large numbers of men for a common but often a somewhat indefinite purpose; while a *coup d'état* is the work of a single man who has a definite end in view, and who strikes quickly for the accomplishment of his purpose. Revolution is often protracted; but a *coup d'état* invariably results in immediate success or failure. Some of the most remarkable instances of violence of this kind are the following: In the early history of Rome during the conspiracy against the elder Tarquinius, Servius Tullius appealed to the plebeians and succeeded in getting himself named king by the assembly of the curies. At a later period the Gracchi, who had come to have so great influence with the popular party as to threaten the legally constituted authorities, were assailed and put to death by direction of the government. Of a similar nature was the death of Julius Cæsar at the hands of the republican leaders. Cicero caused the coadjutors of Catiline to be put to death without the form of a trial. The bloody proscriptions of Sylla were a gross violation of legal forms; and the fall of Sejanus was also accomplished by illegal means of the same kind. In modern times the massacre of St. Bartholomew in 1572 was a celebrated instance. Though several good illustrations of this method of accomplishing political ends occurred in the reigns of Louis XIII. and Louis XIV., it was not till the Revolution of 1789 that *coups d'état* became a common method of accomplishing desired results. It was in this way that the Montagnards overthrew the Girondists, and the Thermidorians in turn proscribed the Montagnards. Robespierre, after having put to death Hébert and Danton, was himself sacrificed by the *coup d'état* of the 9th Thermidor. The Directory, which succeeded in proscribing two of its

own members and fifty-three deputies on the 18th Fructidor, was itself overthrown by means of a violent *coup d'état* on the 18th Brumaire under the direction of Bonaparte. Still more celebrated was the *coup d'état* of Louis Napoleon, by which, on Dec. 2, 1851, he renounced the title of president and assumed the title and powers of an emperor. At about the same period numerous examples of this method of perpetuating power occurred in Germany. During the revolution of 1848 many of the German sovereigns promised charters to their people as the price of submission. As soon as peace was restored, these promises were repudiated. Whenever the representatives of the people clamored for a charter the rulers dissolved the diets. The year 1849 was marked by numerous instances of the *coup d'état* in Germany and Italy. In European countries since the middle of the century they have been common only in Spain. The history of South America and of Mexico has been disfigured by *coups d'état* too numerous to mention.

C. K. Adams.

Couple of Forces (commonly called simply a "couple"): a combination of forces which tends to make a body rotate about some axis, without moving or exerting any pressure upon the axis. It is equivalent to two equal and parallel forces acting in opposite directions, but not in the same straight line. For example, if a body is acted on at one point by a force toward the north, and at another point by a force toward the south, the two points not being in the line of the forces, a tendency to rotation is produced around a vertical axis. The properties of couples were first investigated by Poinsot, who introduced the term. See Composition of Forces.

S. Newcomb.

Courbet, koor'bā'. Gustave: genre, landscape, and portrait painter: b. at Ornans, Doubs, France, June 10, 1819; pupil of David d'Angers. He received medals at the Salons of 1849, 1857, and 1861. Since his death his pictures have greatly increased in value, and he is now considered one of the most important figures in modern art. He first attracted attention by his exhibition at the Salons of 1849 of his pictures *After Dinner at Ornans* and *Burial at Ornans*. But at the Salon of 1851, where he exhibited *The Stonebreakers*, he gave the signal, so to speak, for a battle with then existing traditions in art that has been fought by artists ever since. In *The Stonebreakers* and other works by Courbet, painted in succeeding years, there is a direct hardy process of painting from nature without choosing or elimination, centering the interest in the work solely on effect of light and air. *The Stonebreakers* was more or less of a tentative work, and afterward in such pictures as *The Haunt of the Deer* and the portrait called *The Man with the Leather Belt*, both of which are in the Louvre, he showed his extraordinary power as a realistic painter. The *Haunt of the Deer* is his most complete and satisfactory work in many respects, and nothing could be more frankly and hardily painted than this nook in the forest with the deer nibbling at the foliage and reposing, half hidden by the ferns on the banks of a shallow brook that bubbles among the rocks. It is strikingly like nature itself, and is a real *tour de force* in technique. Some of Courbet's works are in the U. S.; among others, *Woman with a Parrot*, *The Quarry*, *Young Women of the Seine*, and *Doe Run Down in the Snow*, in the Boston Museum of Fine Arts. Courbet was a prominent communist, and it was by his order that the Vendôme Column in Paris was pulled down in 1871. He was sentenced after the Government forces entered the city to six months' imprisonment and to pay for the cost of re-erecting it. He left Paris after his release and passed the rest of his life in Switzerland. D. at Vevay, Jan. 1, 1878. William A. Coffin.

Courbevoie, koor'be-vwăă': a town of France; department of Seine; on the left bank of the river Seine; 1½ miles N. W. of the fortifications of Paris (see map of France, ref. 3–F). It is well built and has large barracks and a carriage-factory. Pop. (1896) 20,105.

Courg: a province of British India. See Curg.

Courier [from Fr. *courir*, run]: literally, a runner, a messenger or bearer of dispatches, usually on public business. According to Xenophon, couriers were first employed by Cyrus the Great. Herodotus speaks of the Persian *cassids* or foot-messengers, who traveled with great rapidity. They were stationed, one man and one horse, for each day's journey; and by these messengers Xerxes sent the news of his defeat to Persia (480 B. C.). Gibbon bears testimony to the rapidity with which communication was carried on in the Roman empire by the regular institution of posts. The Mexican couriers, according to Prescott, traveled with incredible swiftness. The Peruvian *chasquis* or runners carried dispatches at the rate of 150 miles a day.

Courier, or **Courier de Méré**, koo'ri-ā'de-mā'rā', Paul Louis: French scholar and writer; b. in Paris, Jan. 4, 1772. He entered the army in 1792, and served with distinction. In 1809 he resigned his commission. He translated several Greek classics into French, and produced a good edition and version of Longus (1810). He was liberal in politics, and acquired a high reputation as a political writer. Among his writings, which display wit, eloquence, masculine sense, and genial attire, is the *Pamphlet des Pamphlets* (1824). The most complete collection of his writings is *Mémoires, correspondance et opuscules* (1828). He was assassinated on his estate in Touraine Apr. 10, 1825.

Cour'lan: either of two large, rail-like birds of the genus *Aramus*; intermediate between the rails and cranes. Externally they resemble rails, structurally the cranes. *Aramus scolopaceus* is from Eastern South America; *Aramus pictus*, the limpkin or crying bird, from the West Indies, Central America, and Florida. It is about 2 feet long, chocolate brown, with a slight gloss, paler on the throat and head, and marked with numerous streaks of white. The bill near the tip is slightly bent to one side, an almost unique feature.

F. A. Lucas.

Cour'land, or **Kurland**: a Baltic province; incorporated with Russia by the third partition of Poland in 1795. It is bounded on the N. by the Gulf of Riga and on the W. by the Baltic, and lies between lat. 56° and 58° N. and lon. 21° and 27° E. Area, 10,535 sq. miles. The chief river is the Duna, which flows along the northeastern border. The soil is in some parts very fertile, but there are many forests, lakes, and swamps. The greater part is occupied by Germans. Courland was originally an independent duchy, but in 1561 acknowledged the feudal sovereignty of Poland and later that of Russia. Capital, Mitau. Pop. (1897) 672,539.

Court [from O. Fr. *cort* (Mod. Fr. *cour*): Ital. *corte* < Lat. *cōrs* (*cohors*), *cōr'tis*, court-yard]: originally an inclosure or yard; the residence of a sovereign; a royal or princely household. In England and some other countries the term usually denotes the family and attendants of the sovereign, regarded in a public capacity. Also a judicial tribunal, whether composed of one or more judges; sometimes the hall or room in which judges sit and try causes. The term "court circle" is applied in Great Britain to the nobles, bishops, ministers of state, and other persons who are in the habit of approaching the sovereign and of associating with the other members of the royal family. See Courts.

Court, koor, Antoine: French Protestant preacher; b. at Villeneuve de Berg, in the department of Ardèche, May 17, 1696; began his activity as a traveling preacher under great dangers in 1714; formed congregations in Languedoc, Dauphiné, Provence; organized the first synod of the "Church of the Desert" (1715), and retired in 1729 to Lausanne, where he founded a school for the education of Reformed ministers. D. at Lausanne, June 15, 1760. See his life in Hughes's *Histoire de la restauration du protestantisme en France* (Paris, 1872).

Courtat, koor'taa', Louis: figure-painter; b. in Paris, Sept. 6, 1847. Pupil of Cabanel; first-class medal, Salon, 1875. His *Leda*, a finely painted nude female figure, beautiful in color and firmly modeled, is in the Luxembourg Gallery, Paris. Studio in Paris.

W. A. C.

Court de Gébelin, koor'de-zhā'blăñ', Antoine: scholar and author; b. at Nîmes in 1725; son of Antoine Court (*q. v.*). He devoted much attention to mythology and the affinity of languages. Among his works is *The Primitive World Analyzed and Compared with the Modern* (9 vols., 1773–84). He assisted Benjamin Franklin in editing a periodical entitled *The Affairs of England and America* (15 vols., Paris, 1776, *et seq.*). D. in Paris, May 10, 1784.

Courtenay, kŭrt'ni, Edward Henry, LL. D.: military officer and educator; b. in 1803 in Maryland; graduated at West Point in 1821. He served, while lieutenant of engineers, as assistant professor at the Military Academy 1821–24; in construction of Fort Adams, R. I., 1824–26; as assistant to chief engineer 1826–28: and as acting Professor of Natural and Experimental Philosophy at the Military Academy 1828–29; appointed full professor Feb. 16, 1829, on the resignation of his lieutenancy, and with great credit to the Military Academy and profit to his pupils held the chair of

Philosophy till Dec. 31, 1834, when he accepted the professorship of Mathematics in the University of Pennsylvania, continuing in it till 1836; civil engineer New York and Erie R. R. 1836–37; at Fort Independence, Mass., 1837–41; and construction of dry-dock, Brooklyn Navy-yard, 1841–42. He resumed his former vocation, for which he was admirably fitted, as Professor of Mathematics in the University of Virginia 1842–53; translator and editor of Boucharlat's *Mechanics* (1833), and was author of a *Treatise on Differential and Integral Calculus, and Calculus of Variations*. D. at Charlottesville, Va., Dec. 21, 1853.

Courtesy (or **Curtesy**) **of England**: the tenure by which, at common law, a man upon the death of his wife holds a life estate in the lands or tenements of which she was seized in possession in fee simple or in tail during the marriage where they have had lawful issue, born alive, and capable of inheriting the estate. This tenure exists in England, and also in its original or in a modified form in many States of the U. S. An estate by courtesy is a freehold estate for life. See ESTATES. F. STURGES ALLEN.

Courtesy Titles: titles assumed by individuals, given by custom, but to which they have no legal claim. Such titles are common in countries where there are different orders of nobility, in which cases it is customary to give to the sons and daughters of a peer having several titles one of his inferior titles. A courtesy title has no effect upon the legal status of the person to whom it is given, and does not raise him above the rank of the commoner. For example, the eldest son of the Duke of Bedford has the title of Marquis of Tavistock, and the eldest son of the Duke of Buccleuch has the title of Earl of Dalkeith. The younger sons of dukes and marquises take the title of "lord." The daughters of dukes, marquises, and earls have the courtesy title of "lady." A woman marrying a person with a title inferior to hers, or with no title, retains her own title as a courtesy title. In Scotland the eldest son of a viscount or baron has the title of "master." F. STURGES ALLEN.

Court Martial: in the army, navy, and marines, a tribunal for the examination and punishment of offenders against martial law or against good order and military or naval discipline. The subjects of courts martial are usually officers or men in actual service, but when martial law prevails courts martial sometimes punish offenses committed by persons not in the service.

Courts martial are called "general," "garrison," and "regimental." Summary and informal courts held in the field are sometimes called "drumhead courts martial." The officers of military and naval courts are a president, a JUDGE-ADVOCATE (*q. v.*), and a clerk, all commissioned officers. The sentences passed by these courts are usually subject to the approval of department commanders or other high officers, or even to that of the President of the U. S. See S. V. Benét on *United States Military Law* (1862); Clode, *Military and Martial Law* (1872); Simmons, *On the Constitution and Practice of Courts-martial* (1878).

Courtney, LEONARD HENRY, M. P., P. C.: British statesman; b. at Penzance, July 6, 1832; educated there and at St. John's College, Cambridge (B. A. as second wrangler and first Smith's prizeman 1855); elected fellow at St. John's 1856; called to the bar 1858; Professor of Political Economy at University College, London, 1872–75. Returned to Parliament from Liskeard in 1876, he became Under Secretary of State for the Home Department in Dec., 1880; for the Colonies in Aug., 1881; Financial Secretary to the Treasury in May, 1882; privy councilor 1889. He is an advocate of proportional representation and a more extended system of local government; has contributed to the *Times*, *Fortnightly Review*, *Nineteenth Century*, and *International Review*; and is author of a pamphlet on *Direct Taxation* (1860), and a paper on the *Finances of the United States 1861–67* in the *Journal of the Statistical Society* (1868).
C. H. THURBER.

Court of Private Land Claims: a court of the U. S., consisting of a chief justice and four associate justices (to be appointed by the President by and with the advice and consent of the Senate), three of whom constitute a quorum. It has jurisdiction over claims by any person or corporation to lands within limits of the territory derived by the U. S. from the republic of Mexico, by virtue of any such Spanish or Mexican grant, concession, warrant, or survey, as the U. S. are bound to recognize and confirm by virtue of the treaties of session. Cases are instituted by a petition, and the effect of a confirmation of title has no further effect than to release all claim of title by the U. S. An appeal lies for either party to the Supreme Court. F. STURGES ALLEN.

Courtois, koor'twäă', GUSTAVE: figure and portrait painter; b. in Pusey, Haute-Saône, France, 1852; pupil of Gérôme. *Bayadere* (1882) is a single figure of a young woman in gauzy black drapery that contains the cleverest possible painting, but his work in general falls short of a high level on account of a somewhat flippant air that is given by what can only be termed false cleverness. His *Dante and Vergil in Hell* (1880) is a powerful conception, and seriously painted. First-class medal, Paris Exposition, 1889; Legion of Honor 1889. Studio in Paris. W. A. C.

Courtrai, or **Courtray** (anc. *Cortoriacum*: Flem. *Kortryk*): a town of Belgium; on the river Lys; 26 miles S. W. of Ghent (see map of Holland and Belgium, ref. 10–B). It is well built and clean, has a castle, a fine old bridge, a noble town-hall, and a beautiful Gothic church founded in 1238. Here are manufactures of damasks and other linen fabrics, hosiery, lace, paper, cotton goods, soap, etc. This place was taken in 880 A. D. by the Normans, who fortified it. In July, 1302, the Flemings here defeated the French in the famous "Battle of the Spurs," so called from the great number of spurs taken from the fallen knights. Pop. (1896) 32,517.

Courts (in law): public tribunals established for the administration of justice and the interpretation and enforcement of the law. The protection of private rights, the punishment of criminal offenses, the regulation of conflicting interests of individuals and states, the exposition and application of legislative enactments, and, in some nations, even of constitutional provisions, are the various important functions which are generally deputed to such judicial organizations. It can not be said, however, that all tribunals which have been designated courts in various countries and at different epochs have enjoyed all these prerogatives, or have exercised them so exclusively as is understood to be the appropriate province of courts at the present day among civilized communities. In a primitive form of society the powers of the judiciary are usually much restricted, and subjected, to a greater or less degree, to executive and legislative interference. This remark applies also to despotic governments, even though a high degree of civilization be attained, as the history of France and Germany bears ample witness. In modern times, however, it has been recognized as a necessity to confer upon the courts the powers above enumerated, and to render their independence of the other departments of government as complete as possible. They are generally composed of distinct bodies of officials holding their positions during stated terms, and are under no supervisory control for decisions rendered or other legal acts performed but that of superior or appellate organizations of a similar nature. In the exercise of their powers courts do not attempt to ferret out and redress every evil and form of injustice that may exist within society, and determine the law of their own motion by the direct establishment of legal principles, but are confined to the decision of controverted questions presented to them by injured parties, and thus evolve the law indirectly and mediately. Criminal cases are presented by the government, while those of a civil nature are brought either by states or individuals affected therein, at their own option.

But while there is a general agreement among civilized nations at the present day in regard to the objects to be attained by the creation of courts, the modes by which the same results are sought are notably and strikingly diverse. The courts upon the continent of Europe and in Scotland administer a system of jurisprudence derived from the civil or Roman law, while in England and the U. S. they apply a system which they themselves have originated, called, by way of distinction, the "common law." In the latter the rule of precedent holds sway, in accordance with which principles determined in previous decisions are, in general, to be deemed authoritative in subsequent causes involving similar circumstances. In this system, moreover, the mode of trial by jury was developed as a safeguard against oppressive action by the courts, and has been sedulously maintained as far as its application is reasonably practicable. The judge does not examine witnesses nor decide any questions but points of law, so that every inducement may be removed which would lead him to act as advocate instead of arbiter, and awaken his personal interest in the cause.

A broad distinction is also drawn between actions which are termed legal and suits which are called equitable, the latter dispensing with a jury, administering a more adequate relief in many instances, and in various ways supplementing the deficiencies of the proceedings applicable to the former. In the European courts, on the other hand, which proceed upon the doctrines of the civil law, the force of precedent is not recognized as a controlling principle. Jury trials have only been introduced as a foreign system, are employed in a comparatively small class of instances, and are looked upon with so little favor that any extension of their application is generally thought undesirable. The judges, moreover, may engage directly in the examination of witnesses and prisoners, and not infrequently, particularly in criminal trials, appear to become so strongly biased in consequence as seriously to impair one's belief in the impartial administration of justice. And lastly, no distinction of causes and remedies as legal or equitable is attempted. In fact, the English practice in this respect has even excited the derision of continental lawyers, who charge that it presumes two different kinds of justice.

Besides these fundamental points of difference between the two systems, there are great diversities between the several countries in the number, the character, and the functions of the various courts which have been established, and their relations with each other, which will require an investigation into the judicial system of each of the more important modern nations specifically. England, Scotland, France, and the U. S. will be selected for this purpose, and reference made to their most important tribunals in detail.

I. The Courts of England.—By the common-law system of England and the U. S. courts are distinguished as those *of record* and those *not of record*. A court of the former class is provided with a clerk and a seal, and receives its name from the fact that its proceedings are required to be preserved in accurate *records*; courts of the latter class are inferior tribunals without clerk or seal, and their acts are not formally enrolled. Courts are said to have *original* jurisdiction before which causes are brought in the first instance; *appellate* jurisdiction when decisions rendered in inferior tribunals are transferred to them for review. Civil causes heard before a single judge, with a jury, are said to be heard at *nisi prius* or at circuit; when several judges sit to review causes on appeal they are said to sit *in banc*. Courts are also distinguished as civil or criminal, superior or inferior, as courts of law, of equity, of admiralty, etc.—distinctions which require no explanation. In the following synopsis of the English courts an account will be given (1) of the superior common-law courts of record; (2) of the superior courts of equity; (3) of the ecclesiastical courts; (4) of the courts of probate, divorce, and admiralty; (5) of the criminal courts; (6) of the appellate courts as they existed for very many years, and until the reform legislation beginning in 1873, which is hereafter considered.

(1) *The Superior Common-law Courts of Record.*—These were the Court of Common Pleas, the King's (or Queen's) Bench, and the Court of Exchequer. These several tribunals are considered to have been derived originally from a single organization, the *Aula Regis* (or King's Council), which was the only superior court in the realm during the early history of the Roman kings. This had both civil and criminal jurisdiction, and was ambulatory, or attendant upon the person of the king, holding its sessions in such different parts of the kingdom as he entered in the course of his journeyings. The courts were, when first created, nothing more than subordinate branches or committees of the council, established for the more speedy transaction of business. The exchequer branch entertained questions relating to the royal revenue; that of the common pleas, civil suits between individuals except for forcible injuries; while there was left to the *Aula Regis* proper, jurisdiction in criminal causes and in civil actions for injury by violence, and a general controlling power over inferior tribunals.

In the reign of Edward I. (1272) the three bodies were constituted separate courts, were all fixed at Westminster, and their powers, as distinct tribunals, determined. Each retained, however, its previous particular jurisdiction. But in the course of time, by a gradual process of encroachment, justified by ingenious legal fictions, each court trenched upon the appropriate province of the others, assuming thereby similar powers, so that finally they all entertained co-ordinate jurisdiction in nearly all civil causes. The Court of King's (or Queen's) Bench, however, retained to the last exclusive cognizance of criminal matters and the sole superintendence over inferior courts and civil corporations; the Court of Common Pleas alone had the right to entertain real actions—i. e. actions for the specific recovery of real property (actions now rarely brought); while the Court of Exchequer continued to exercise entire control over strict questions of revenue. In other cases the parties to the action could select any one of the courts they might prefer. As regards the organization of these common-law courts, the King's (or Queen's) Bench and Common Pleas consisted each of a chief justice and five puisne justices; the Exchequer, of a chief baron and five puisne barons. These judges held office during good behavior, but could be retired on a pension after fifteen years' service. An appeal lay from any one of these courts to the Exchequer Chamber, which, when hearing a cause sent from one of them, was composed of the judges of the other two. A second appeal could also be taken to the House of Lords.

To remedy the inconvenience to suitors arising from the fixed establishment of these courts at Westminster, provision was made at an early period for the hearing of jury trials in every county one or more times during each year. The tribunals for this purpose were and still are called *courts of assize and nisi prius*, and are held, now as formerly, by royal commission, either (*a*) general—now issued twice a year to the judges of the High Court of Justice, two judges usually being assigned to each Circuit (*q. v.*), or (*b*) special—issued to certain judges to try certain causes or crimes. Appeals from them, however, can only be heard at Westminster.

(2) *The Superior Courts of Equity.*—It was found at an early period that the common-law tribunals, determining causes as they did only through the instrumentality of juries in the first instance, and in all cases, where no demand was made for specific property, giving only pecuniary damages as relief, were totally inadequate to administer exact justice in a large variety of cases, and the separate system of equity jurisprudence was established to repair the deficiencies of the strict legal methods. These courts were likewise governed by the rule of precedent, but their modes of procedure were less technical, their forms of remedy more diverse, and they employed no juries, though a practice existed of referring special questions to courts of law to be tried by a jury, whose verdict was reported to the equity judge to aid his future action. The equity judges consisted of three vice-chancellors, a master of the rolls, two lords justices, and the lord chancellor. The vice-chancellors and the master of the rolls held each separate courts at which causes were heard in the first instance; so that there were four equity tribunals of original jurisdiction. Appeals could be taken from either of them to the Court of Appeal in Chancery or to the lord chancellor.

The Court of Appeal in Chancery was composed nominally of the two lords justices and the lord chancellor, but almost invariably it is held by the lords justices alone. Any two of these three judges, however, were sufficient for holding the court, or even the lord chancellor alone. Moreover, each of the justices could, under certain restrictions, sit alone. The chancellor could, in addition, exercise an independent jurisdiction, without acting as a member of the court of appeals. This jurisdiction was ordinary when according to common-law methods: extraordinary, when equitable in its nature. An appeal could be taken to the House of Lords. The term of office of these judges was the same as that of the common-law judiciary, except in the case of the chancellor, who could be deprived of his position at the pleasure of the crown.

(3) *The Ecclesiastical Courts.*—These courts derived their authority and powers from the immemorial usage of the Church, and administered justice according to the principles of the civil and canon laws. At one time these courts had a large share in the administration of justice, and their jurisdiction was by no means restricted to spiritual interests. In England the clergy always had the right to exclude the laity from the judgment of spiritual causes, and in the time of the Conqueror a law was promulgated making mandatory the trial of ecclesiastical causes in the ecclesiastical courts. These courts had jurisdiction of offenses committed by the clergy upon the clergy; but if one of the clergy committed an offense upon a layman, the clerical offender might be punished in the secular courts, provided the ecclesiastical court had previously found him guilty, deprived him of his order, and turned him over to the temporal courts. If the ecclesiastical court refused to try the offender, or found him not guilty, and declined to turn him over to the temporal courts, he was free from all outside interference.

These courts had jurisdiction over cases arising from the withholding of tithes, the non-payment of ecclesiastical dues to the clergy, the spoliation of a benefice, ecclesiastical waste, and the neglect of reparations of the church, churchyard, and the like. They also had jurisdiction over matrimonial and testamentary causes. In 1857 the ecclesiastical courts were deprived of their jurisdiction over testamentary and matrimonial causes. In 1876 the question was raised whether an ecclesiastical court had jurisdiction in a criminal suit against a layman for false swearing. In holding that the jurisdiction did not exist, the judge declared that while such jurisdiction had not been expressly taken away by statute, yet it had inferentially, as the statute gave jurisdiction over cases of false swearing to the temporal courts, citing a maxim from Coke that "where the common or statute law giveth remedy in *foro seculari* (whether the matter be temporal or spiritual), the conusans of that cause belongeth to the king's temporal courts only, unless the jurisdiction of the ecclesiastical court be saved or allowed by the same statute to proceed according to the ecclesiastical law." The judge writing the opinion said: "It cannot, I think, be doubted that a recurrence to the punishment of the laity for the good of their souls, by ecclesiastical courts, would not be in harmony with modern ideas, or the position which ecclesiastical authority occupies in the country, nor do I think that the enforcement of such powers where they still exist, if they do exist, is likely to benefit the community." (*Phillimore* vs. *Machon*, 1 P. D., 488.) Practically the civil jurisdiction of the ecclesiastical courts over the laity has ceased to exist, except in matters relating to the fabric and ornaments of the church, the churchyard, and churchwardens. They are now about on a level with courts martial, exercising jurisdiction over the clergy of the Established Church in their professional character, as the military courts deal with soldiers and sailors. (Wilson's *Modern English Law*, p. 248.) The common-law courts restrain, by a writ of prohibition, the ecclesiastical courts from exceeding their jurisdiction, and can compel them to exercise their jurisdiction by a writ of mandamus. The right to practice in the ecclesiastical courts, formerly confined to proctors, has been extended to solicitors, and in the taking of evidence oral has been substituted for written testimony. In the U. S., ecclesiastical courts have never existed in the sense in which they have existed in England.

(4) *The Courts of Probate, Divorce, and Admiralty.*—The Court of Probate and that of Divorce were established in 1857 to supersede the former ecclesiastical courts, and received more extended powers. Their names sufficiently define the nature of their jurisdiction. The judges of either of these tribunals could try questions of fact with a jury, or could order an issue to be tried by a court of law. Appeals could be taken to the House of Lords. The Court of Probate had only a single judge, who could, however, associate with himself a common-law judge or judges. The appropriate labor of this tribunal was facilitated by the establishment of district registries throughout the realm. These were forty in number, besides the principal registry in London, all having power to grant probate and administration.

The Court of Divorce consisted of the judge of probate, the lord chancellor, and the judges of the superior common-law courts. The probate judge was made judge ordinary, and could act alone or with the other judges. The power to grant divorce, which was conferred upon this court, was exercised till 1857 only by Parliament. Actions for criminal conversation could also be maintained in this court.

The High Court of Admiralty had cognizance of causes of action arising from the navigation of the seas, as e. g. claims for repairs of foreign vessels and for supplies furnished them, actions for pilotage fees, for seamen's wages, for personal injuries inflicted at sea or injuries by collision, seizure, and the like; also to determine matters of prize in time of war, and decree the forfeiture of vessels of the enemy or of neutrals in proper cases. This court was held by a single judge, who was appointed by the crown. He could be the same person as the judge of probate.

(5) *The Criminal Courts.*—These were divided into the inferior and the superior, the former including the general and quarter sessions of the peace, while the latter embraced the assizes, the admiralty sessions, the Court of King's (or Queen's) Bench (now a part of the High Court of Justice), and the Central Criminal Court, which is retained in the present system of courts. The assizes were and still are held by royal commission twice a year in nearly all the counties. The judges act by virtue of various commissions, the most important of which are those of "oyer and terminer," by which they are empowered to try treasons, felonies, and trespasses, and "general jail delivery," empowering them to try every prisoner in a specified jail, for whatever offense committed, so as to clear the prisons.

The King's or Queen's Bench was the highest court of criminal jurisdiction. This prerogative, as has been seen, it enjoyed to the exclusion of the other superior common-law courts.

The Central Criminal Court was erected in 1834 for the trial of treasons, felonies, and misdemeanors committed within the city of London and county of Middlesex, and certain parts of other counties.

The other criminal courts require no particular mention.

(6) *Appellate Courts.*—(*a*) The Exchequer Chamber, to which appeals were first taken from the King's Bench, the Common Pleas, and the Exchequer, was composed, as already explained, of the judges of the two courts in which the action was not heard originally.

(*b*) The Judicial Committee of the Privy Council is a tribunal of privy councilors, established to try appeals to the sovereign in council from colonial and ecclesiastical courts, from the Court of Admiralty, and from certain orders in lunacy. It is a court of record, and is composed of a lord president, all the equity judges, the three chief judges of the common-law courts, and certain other officials to the number of twenty or more. Only four, however, are required to constitute a quorum. Of the whole number of members (except two retired East Indian judges) only four receive a salary as such, are required to attend the sittings, and retain their positions during good behavior. The members of the Council generally hold office during the pleasure of the crown. There is no appeal to the House of Lords, and there is, consequently, danger of a conflict of authority between these tribunals of last resort. The jurisdiction of this court in appeals from the High Court of Admiralty and from orders in lunacy was taken away by the Judicature Act, 1873, s. 18.

(*c*) The House of Lords. Though, in theory, this entire body constitutes the appellate tribunal, and any of the lords might, if so disposed, assume to act as judges, yet the judicial functions are, in reality, entirely delegated to a few members of the legal profession, known as the "law lords." The services of the others are only available when they are needed to make up a quorum, for which three members are required. The organization of this court has several objectionable features, since the sittings are only held while Parliament is in session; there is no regularity of attendance required on the part of members; and a judge may sometimes sit in review of his own decisions. The decisions rendered, however, enjoy generally a great reputation from the eminence of those who usually act as judges.

The system of courts above described has been remodeled in recent years by a series of acts known as the Judicature Acts, beginning in 1873, and known as 36 and 37 Vict., c. 66; 37 and 38 Vict., c. 83; 38 and 39 Vict., c. 77; 39 and 40 Vict., c. 59; 40 and 41 Vict., c. 9. By this legislation all the higher courts of law and equity were merged in a Supreme Court of Judicature, consisting of a High Court of Justice and a Court of Appeal. The High Court of Justice never sits as a whole, but is divided into five departments, four bearing the names of the four great courts which preceded them, viz.: the Chancery Division, the King's (or Queen's) Bench Division, the Common Pleas Division, and the Exchequer Division. The other department is known as the Probate, Divorce, and Admiralty Division. Each of these divisions possesses very much the same jurisdiction as did the courts of the same name which they displaced, and which have been previously described, though with some important differences of authority. The lord high chancellor presides over the Chancery Division, and the lord chief justice over the Queen's Bench Division. The Court of Appeal is composed of six judges, and sits in two divisions, one for law and the other for equity, although any judge may sit on either side. The judges hold office for life, though they may be removed by the crown on the address of Parliament. Their salary is £5,000. The salary of the lord chancellor is £10,000, and that of the lord chief justice is £8,000. A uniform system of pleading and procedure has been established, and it has been provided that in every civil cause or matter entertained in the Supreme Court of Judicature law and equity shall be concurrently administered, and that equitable rules shall supersede those of the law when any conflict arises. It is still true, however, that causes of action which in themselves have been hitherto

considered distinctively equitable are to be brought before the Chancery Division, which took the place of the four chancery courts of original jurisdiction.

In a large number of questions several divisions have co-ordinate jurisdiction. It is accordingly provided that any person commencing a cause may assign it to any proper division he may think fit by marking his documents with its name. If a wrong assignment be made, a transfer may be had, on proper application, by direction of the court or by a judge of the division in which the matter is brought, or the cause may even be retained if a transfer would be inexpedient.

Every appeal to the Court of Appeal is heard either by the whole court or by a divisional court consisting of any number, not less than three, of the judges thereof. Appeals may also be reargued before decision, or be reheard before final judgment, before a greater number of judges, if the Court of Appeal so direct. But no judge shall hear a case on appeal which he himself decided, or helped to decide, originally.

The House of Lords still has appellate jurisdiction from the Court of Appeal, although its functions in this respect are really exercised by a committee composed of such peers as are holding or have held high judicial office, and three lords of appeal in ordinary. The House of Lords has been recognized as a court of appeal from the days of Queen Elizabeth. From the time when O'Connell's case came before the House on appeal, in 1844, no attempt has ever been made by the lay peers to exercise judicial functions. So strong was the feeling against O'Connell that a number of the lay peers, who could not bear to see the Irish agitator escape punishment for sedition on a purely technical point, expressed an intention of voting on the appeal. It was, however, so strongly urged on them that by custom, though not by strict law, the judicial functions of the House had not been exercised by lay peers, and that it was only by the observance of this custom that the decisions of the House could command respect, that they finally withdrew and left the matter to the law lords alone. No disposition has since been manifested to infringe this principle.

II. The Courts of Scotland.—Although both England and Scotland belong to one united kingdom and have but a single legislative body, the Houses of Parliament, their judicial organization is almost entirely diverse. There is one tribunal of supreme appellate jurisdiction, the House of Lords, which is common to both countries, but this is the only element of correspondence in the two systems. Scotland administers the civil law instead of the common. The courts of chief importance are the Court of the Sheriff, or sheriff-substitute, and the Court of Session. The Scottish sheriff differs from the English in not being confined to the performance of merely ministerial duties. He acts also as the chief local judge of the county to which he belongs. The jurisdiction he exercises is both civil and criminal, and is quite extensive in its scope. In civil causes it extends to all actions on contract and for damages, no matter how large the amount involved. In matters, however, relating to landed property his authority is much restricted. He has also a summary jurisdiction, conferred by statute, in small-debt cases, where the sum involved is not above £12. In most cases of this kind there is no appeal from his decisions. The sheriff also takes cognizance of bankruptcy, insolvency, and admiralty questions. His criminal jurisdiction extends to all cases which do not infer death or banishment. No jury is employed in the trial of civil causes, but only in those of a criminal nature. Though, however, these various powers are described as appertaining to the sheriff himself, yet in practice, so far as the capacity of hearing causes originally is concerned, they are delegated to a subordinate officer, appointed by the sheriff, and styled a sheriff-substitute. If it is desired to secure the review of a decision rendered by the substitute in the first instance, then the sheriff himself acts in the capacity of an appellate judge. From him also, in proper cases, an appeal may be taken to the Court of Session, and thence to the House of Lords.

The Court of Session is the highest civil tribunal in Scotland. It takes cognizance of all questions of a civil nature, whether legal, equitable, admiralty, or probate, and exercises both original and appellate jurisdiction. It was established in 1532, and, as originally constituted, consisted of fifteen judges, all of whom sat in a body to hear appeals. This arrangement occasioned great dilatoriness of procedure, but continued nevertheless for nearly three centuries, despite this and other commonly recognized inconveniences. The present organization is much different. The number of members has been reduced to thirteen. Five of these are called "lords ordinary," exercise severally original jurisdiction, and constitute collectively what is known as the "Outer House." The eight remaining judges form the "Inner House," and have, as a general rule, only appellate jurisdiction. They are divided into two divisions of four each, either of which possesses the same authority, and may be selected by any party appealing, at his own option. One division is presided over by the lord justice clerk, the other by the lord president. In some few instances the Inner House may exercise original jurisdiction, and in cases of exceptional difficulty the whole body of thirteen judges may consider a question upon appeal; but such cases are very rare. In the trial of civil causes in the first instance before a lord ordinary juries have been employed since 1815, but by no means to so great an extent as in the English practice. The jury system was introduced as an exotic, and does not thrive very vigorously under the unfavorable conditions of a common prejudice against it on the part of clients and hostile criticism by able members of the bar. Juries may be dispensed with, in general, in the discretion of the court or by consent of parties; and, as might be supposed, a resort to these expedients is not infrequent. The constitution of the appellate branches of the Inner House in this system is evidently faulty. There may be an equal division of the judges in either body, so as to render the determination of any question impossible, or the decisions of one branch may directly contradict those of the other, so as to make the law fluctuating and uncertain. The first evil is remedied by calling in a lord ordinary or three judges of the other house to attend a rehearing of the cause, by which means the whole number of judges is made uneven and a majority rendered certain. In the second case the opinions of the whole court may be taken, but this mode of reference is discretionary, and therefore inadequate to meet the difficulty. The final appeal, which may be taken from the Court of Session to the House of Lords, has this peculiar consequence—that it refers questions arising under the civil-law procedure to jurists trained only in common-law methods as a general rule. It can not be said, however, that any practical evils have resulted from this co-operation of systems.

There are several other courts in Scotland composed of members of the Court of Session. Only one, however, deserves mention—viz., the High Court of Justiciary, a tribunal exercising an important criminal jurisdiction. The other courts are of inferior importance.

III. The Courts of France.—The most important courts are the Tribunals of the First Instance, the Courts of Appeal, the Courts of Assize, and the Court of Cassation. The Tribunals of the First Instance, as their name implies, entertain causes originally, and they exercise both civil and criminal jurisdiction. One of them is established in each of the arrondissements into which the whole country is divided. Each of these courts consists of from three to twelve judges, the number varying with the population of the districts. When their number is seven or more, they are formed into two chambers—one for the hearing of civil and the other of criminal causes. When there are twelve judges, three chambers are formed, two civil and one criminal. The tribunal at Paris is so large as to be divided into ten chambers. In civil cases three judges must concur in order to pronounce a decision, while in criminal actions the agreement of five is necessary. Appeals may be taken to the Courts of Appeal.

The Courts of Appeal are twenty-seven in number, and each of them is named from the city or place in which it is situated. They consist severally of at least twenty-four judges, who are generally divided into three chambers—one of civil jurisdiction, another of criminal, while the third hears appeals in police matters. Seven judges must concur in the determination of civil causes, five in criminal accusations. The Court of Appeal in Paris has six chambers and fifty-nine judges. Each chamber in all these courts has its own president. When momentous state questions or causes of exceptional complexity are to be decided, two chambers may be united. This is called "the solemn hearing," and the concurrence of fourteen judges is required in order that a decision may be given. Appeals lie from these courts to the Court of Cassation.

The Courts of Assize are composed of judges of the Courts of Appeal, and exercise only criminal jurisdiction. One of these tribunals is established in each of the departments into which France is divided (about eighty in number), and their

institution is peculiar, as compared with French courts in general, in that it exhibits the employment of the English jury system. The jurors, however, are not required to be unanimous in their verdict, a majority sufficing. The number of judges in each court is three, and sessions are held every three months. The amount of business in Paris, however, requires two sessions a month. Appeals may be taken to the Court of Cassation.

The Court of Cassation (i. e. court having power of annulling) is the highest permanent court of appeal in France. It is composed of a first president, three presidents of chambers, and forty-five other judges called counselors. It is divided into three chambers—one for the hearing of appeals in civil causes, another in those of a criminal character, while the third is termed the Chamber of Requests, and takes cognizance of petitions, determines whether appeals are admissible, etc. Appeals must be brought within three months after the previous decision was rendered. The judges, as in all the higher courts of France, hold office for life. The constitution and functions of the Court of Cassation differ quite essentially from those which are conferred upon appellate tribunals in England and generally in other countries, and even upon the subordinate French courts of appeal; for it possesses no power to affirm the judgment of the court below, but only, as its name indicates, to reverse a decision, and transfer the cause for another hearing to some tribunal having co-ordinate jurisdiction with the one in which judgment was first rendered. Moreover, notwithstanding the pre-eminent position of this court, its determination of the law is not considered authoritative upon inferior tribunals, but only as presumably correct and open to contradiction. Instances in which its views are disregarded, however, are of course very rare.

Other French courts of limited jurisdiction but great usefulness are the Tribunals of Commerce, established in all the commercial cities and towns, and the Courts of Prudhommes, existing in Paris and a few of the larger cities. The former consist largely of men experienced in mercantile pursuits, and take cognizance of questions arising in commercial transactions. The latter are mechanics' courts, consisting of manufacturers and artisans, and take charge of matters arising from the relations of employer and employed. They relieve the ordinary courts of much labor.

IV. The Courts of the United States.—In accordance with the provision of the Constitution establishing a Supreme Court and conferring upon Congress the power to create inferior tribunals, a regular system of courts has been formed throughout the Union. The most important are the District Courts, the Circuit Courts, Circuit Courts of Appeals, and the Court of Claims. Final appeals are taken to the Supreme Court at Washington. All these tribunals exercise both law and equity jurisdiction, and the judicial authority given by the Constitution is variously apportioned among them.

The District Courts are now (1893) sixty-six in number. Each State generally constitutes a single district, though some of the larger ones, as New York, Pennsylvania, Illinois, and a few others, are divided into two or three. New districts are formed by Congress as the population increases or new States are admitted, so that the number is subject to constant variation. Each court consists of a single judge, who must reside in the district for which he is appointed. Original jurisdiction is exercised in civil, criminal, and admiralty causes. The classes of questions of which these courts take cognizance are determined entirely by congressional enactment, and are variously modified at different times. They entertain exclusively questions of admiralty or maritime jurisdiction in the first instance, including all seizures upon navigable waters under laws of imposts, navigation, or trade of the U. S., actions for injuries committed upon the high seas, suits to recover upon maritime contracts, actions for salvage, for injuries by collision, and matters of prize. They also have sole original cognizance of questions arising from seizures upon land, and of all suits for penalties and forfeitures under the U. S. laws, and also of actions against consuls or vice-consuls. In addition, they have original jurisdiction in all causes under the bankrupt laws. They exercise concurrent jurisdiction with the Circuit Courts of all crimes and offenses against the U. S. the punishment of which is not capital, of patent and copyright cases, and of all causes, civil or criminal, affecting persons who are denied in the State courts their rights of citizenship under the U. S. laws. They also have concurrent jurisdiction with the Circuit Courts or with the State Courts of all causes where an alien sues for a tort in violation of the law of nations or a treaty of the U. S., and of all suits at common law where suit is brought by the U. S. or any officer thereof. The trial of issues of fact in the District Courts, except in civil causes of a maritime character, is by jury. No person can be arrested in one district for trial in another.

The Circuit Courts are nine in number, and each circuit in which one of these courts is established consists of several States. The nine justices of the Supreme Court are allotted, by their own selection, each to a particular circuit, and each is required to attend at least one term of such court to which he is appointed in each district of his circuit during every period of two years. There is also appointed a special circuit judge in each circuit, within whose limits he must reside. A Circuit Court is held by the Supreme Court justice thereto allotted, or by the regular circuit judge, or by the district judge of the district sitting alone, or by the Supreme Court justice and circuit judge sitting together and the former presiding, or, in the absence of either of these, by the other (who then presides) and the district judge. Such courts may be held at the same time in the different districts of the same circuit. Two sessions of each court are held annually within each district of the circuit. The Circuit Courts have no appellate jurisdiction. Their original jurisdiction extends, concurrently with that of the State courts, to civil suits in law or equity for more than $500 when the U. S. are plaintiffs, or an alien is a party, or the suit is between a citizen of the State where the suit is brought and a citizen of another State. They also entertain causes arising under the revenue laws and some questions of a particular nature in bankruptcy procedure. Their important concurrent jurisdiction with the District Courts has already been mentioned. Provision is made, moreover, for the removal of certain causes—such as actions against revenue officers, suits on titles to land derived from other States, etc.—from the State courts to the Circuit Courts, on proper petition by the defendant and the entering of security.

Circuit Courts of Appeals were established by an act passed Mar. 3, 1891. This act creates in each of the nine circuits, already referred to, a Circuit Court of Appeals, consisting of three judges, of whom two constitute a quorum. The act provides for the appointment in each circuit of an additional circuit judge, and then declares that the chief justice of the Supreme Court of the U. S. and the associate justices of that court assigned to each circuit, and the several district judges within each circuit, shall be competent to sit as judges of the Circuit Court of Appeals within their respective circuits. But no justice or judge before whom a cause or question may have been tried or heard in a district court, or existing court, can sit on the trial or hearing of such cause or question in the Circuit Court of Appeals. A term is to be held annually by the Circuit Court of Appeals in the several judicial circuits at the following places: In the first circuit, in the city of Boston; in the second circuit, in the city of New York; in the third circuit, in the city of Philadelphia; in the fourth circuit, in the city of Richmond; in the fifth circuit, in the city of New Orleans; in the sixth circuit, in the city of Cincinnati; in the seventh circuit, in the city of Chicago; in the eighth circuit, in the city of St. Louis; in the ninth circuit, in the city of San Francisco. Since the passage of this law no appeals, by writ of error or otherwise, can be taken from any District Court to a Circuit Court, and all appeals from the District Courts are subject to review only in the Supreme Court or in the Circuit Courts of Appeals. Appeals or writs of error may be taken from the District Courts or from the Circuit Courts direct to the Supreme Court in the following cases: In any case in which the jurisdiction of the court is in issue; from final sentences and decrees in prize causes: in cases of conviction of a capital or otherwise infamous crime; in any case involving the construction or application of the Constitution of the U. S.; in any case in which the constitutionality of any law of the U. S., or the validity or construction of any treaty made under its authority, is drawn in question; and in any case in which the constitution or law of a State is claimed to be in contravention of the Constitution of the U. S. The Circuit Courts of Appeals exercise appellate jurisdiction over final decisions in the District Courts and the Circuit Courts in all cases other than those mentioned above, unless otherwise provided by law. The judgments or decrees of the Circuit Courts of Appeals are final in all cases in which jurisdiction is dependent entirely upon the opposite parties to the suit or controversy, being aliens and citizens of the U. S., or citizens of different States; also in all cases arising under the patent laws, under the revenue laws, and under the criminal laws and in admiralty cases.

But a Circuit Court of Appeals may, in every subject within its appellate jurisdiction, certify to the Supreme Court of the U. S. any questions or propositions of law concerning which it desires the instruction of that court for its proper decision. And in cases made final in the Circuit Courts of Appeals it is made competent for the Supreme Court to require the case to be certified to it for its review and determination with the same power and authority in the case as if it had been carried by appeal or writ of error to the Supreme Court.

The Court of Claims is a tribunal established at Washington, consisting of five judges, of whom one is appointed chief justice. It has jurisdiction to determine all claims founded upon any law of Congress, or upon any regulation of an executive department, or upon any contract with the Government of the U. S., which are presented to it by petition. All petitions in regard to such claims introduced into Congress are required, unless that body otherwise orders, to be transmitted to this court. So the cabinet officers may refer certain claims made upon their departments. Demands which are adjudged valid are payable from the national treasury. The Court of Claims has a single annual session. Appeals are taken to the Supreme Court.

The Supreme Court is the highest tribunal of the U. S. It consists of a chief justice and eight associate justices, and holds one term annually at Washington. Six justices are required to constitute a quorum. The jurisdiction exercised is both original and appellate, but chiefly, in practice, the latter. The original jurisdiction extends to all cases affecting ambassadors, other public ministers and consuls, and those in which a State is a party, except that in the latter case no suit can be prosecuted against any State by the citizens of another State. In actions *against* ambassadors or other public ministers, and in many controversies where a State is a party, its jurisdiction is not only original, but exclusive. Its other original authority is shared with the inferior tribunals. In the exercise of its appellate powers the Supreme Court reviews the judgments or decrees of the Circuit Courts, of District Courts, of the Circuit Courts of Appeals, of the Court of Claims, and of some tribunals established in the Territories. Moreover, the decisions of the highest State tribunals which are repugnant to the Constitution, treaties, or laws of the U. S. may be re-examined by the Supreme Court, and reversed or modified as may be necessary. It has power to review both the law and the fact in any cause of which it takes cognizance on appeal.

The Federal tribunals in this way possess exclusive jurisdiction over subjects of such manifest national importance as patents, copyrights, admiralty causes, and questions of revenue, and have power to determine controversies between States, and to declare void all laws, whether of Congress or of a State legislature, which are in contravention of the provisions of the U. S. Constitution.

The salaries of the justices of the Supreme Court are fixed by act of 1873 at $10,000, and that of the chief justice at $10,500. Originally the salaries were fixed at the sum of $3,500 for associate justices, and so remained from 1789 to 1819, when they were increased to $4,000, and so continued until 1855, when they were raised to $6,000. In 1871 they were raised to $8,000, and remained at that amount until the law now in force was passed. The salaries of circuit judges are fixed at the sum of $6,000. The salaries of the district judges were originally fixed at from $800 to $1,800. But at present their salaries range from $3,500 to $5,000. Federal judges are allowed to retire after ten years of service and after reaching the age of seventy years, upon the salary they have been receiving, and to draw it as long as they live.

V. The judicial systems of the various States of the Union are so diverse that to give any account of them would be impracticable. They all agree in having a number of tribunals, some of original and others of appellate jurisdiction, and the determination of the law by the courts of each State, subject to the review of the Supreme Court of the U. S. in constitutional matters, is conclusive within its own boundaries. Reference must be made to the constitutions and statutes of the States severally for further details.

Revised by Henry Wade Rogers.

Couscous: same as Cuscus (*q. v.*).

Cousin, Jean: b. at Soucy, near Sens, about 1520. He began by painting on glass, and became known from an early age to the Italian artists who had been brought to France by the king, such as Il Rosso, Bagnacavallo, and especially to Primaticcio, whose style he imitated. He is the first remarkable historic painter of France. He was an excellent draughtsman and a good anatomist. His taste was rather Florentine than French. He drew and painted chiefly on glass, and worked but little in oil. His chief work in oil is the *Last Judgment*, which is now in the Louvre. Although suspected of being a Protestant, he lived without molestation through the reigns of Francis I., Henry II., Francis II., Charles IX., and Henry III., working for all these monarchs. He was the first to apply the rules of geometry to perspective, and wrote several works on both these sciences; also a pamphlet on the proportions of the human figure, illustrated by wood-cuts, and now accepted as a classic. He was also a remarkable sculptor, deserving the title of the French Phidias with better right than Goujon. Perhaps his most important work in sculpture is the sepulchral monument of Admiral de Chabot, formerly in the Celestins, Paris, now in the Louvre. D. in 1589. W. J. Stillman.

Cousin, koo'zăñ', Victor: French philosopher; b. Nov. 28, 1792; was the son of a watchmaker of Paris. After brilliant academic studies, though he had a strong inclination to music, his mind was directed toward philosophy under Laromiguière, Royer-Collard, and Maine de Biran. In 1815 he succeeded Royer-Collard as professor at the Sorbonne, and continued the teaching of the Scotch philosophy initiated by him, and promoted the reaction against the sensualism of Condillac and the thinkers of the eighteenth century. In a journey to Germany he became indoctrinated with the idealistic philosophy. In 1820 he was suspended on political grounds. He published editions of Proclus (6 vols. 8vo, 1820–27) and Descartes (11 vols. 8vo, 1827), and his celebrated translation of Plato (13 vols. 8vo, 1825–40). In 1827 he was replaced in his chair at the Sorbonne, and shared with Guizot and Villemain a popularity and power in the community unexampled in university annals. He was, under Thiers (1840), minister of public instruction for eight months, and delivered in the Chamber of Peers his *Défense de l'Université et de la Philosophie* (8vo, 1844). The revolution of 1848 called forth, in refutation of socialism, *Justice et Charité. Du Vrai, du Beau, et du Bien* appeared in 1853. Of his numerous works have appeared in this country his *Course of Modern Philosophy* (1855) and *Lectures on the True, the Beautiful, and the Good* (1857), translated by O. B. Wight. But his chief work is his *Fragments Philosophiques* (1826). His philosophy was eclecticism. (See Sir William Hamilton's criticism in *Edinburgh Review* for 1829). He was more critical than systematical. He formed no school, but he exercised a very great influence, leading new and fertile streams of philosophical ideas into French civilization. On primary education he also exercised a decided influence. (See his celebrated *Rapport sur l'État de l'Instruction Publique*, translated into English by Mrs. Austin, 1834.) Of great importance was also his edition of Abelard's works, accompanied with new, and in many respects exhaustive, researches of that period of scholasticism. D. at Cannes, Jan. 13, 1867.

Cousins, Samuel, R. A.: mezzotint engraver; b. at Exeter, England, May 9, 1801; apprenticed to S. W. Reynolds in 1814; aided him in many of his plates; began to engrave on his own account in 1826; associate engraver of the Royal Academy 1835; Royal Academician engraver 1855, retiring in 1880. He produced plates after Landseer, Lawrence, Sir Joshua Reynolds, Leighton, Millais, and other painters. Especially noted are *Master Lambton* and *Mrs. Peel*, after Lawrence; *Bolton Abbey in the Olden Time* (Landseer); *The Strawberry Girl* and *Penelope Boothby* (Reynolds); *Pomona* (Millais); and *Marie Antoinette in the Temple* (E. M. Ward). He gave £15,000 in trust to the Royal Academy for relieving artists in sickness and old age. D. May 7, 1887.

Coutances, koo'taans' (anc. *Constantia*): a town of France; department of Manche (see map of France, ref 3–C). It was formerly fortified. It is the seat of a bishop, and has a handsome old cathedral, a public library, a theater, and manufactures of druggets, worsted stuffs, hardware, etc. Pop. (1896) 7,403.

Couture, koo'tür', Thomas: historical and genre painter; b. at Senlis, Oise, France, Dec. 15, 1815; d. at Villiers-le-Bel, Seine-et-Oise, Mar. 31, 1879. Pupil of Baron Gros and Delaroche; second Prix de Rome 1837; first-class medals, Salon 1847 and Paris Exposition 1855; Legion of Honor 1848. Couture, who was already known as a painter of ability, created a great sensation in the art world by the exhibition at the Salon of 1847 of his great picture *The Decadence*

of the Romans, which is now in the Louvre. It is a work of wonderful power, and fine in composition and drawing. In color it may be reproached with a tendency to too great warmth in the shadows, but it is harmonious in tone and complete in ensemble. He had many pupils, but his influence was not always good on young painters, many of whom adopted his peculiarities of method without attaining to the results achieved by the master. The modern school in France has now completely outgrown the once marked influence of his style. A canvas by him, a study for *The Volunteers of 1793*, is in the Boston Museum of Fine Arts.

WILLIAM A. COFFIN.

Covenant [O. Fr. *convenant*, ptc. of *convenir* < Lat. *convenīre*, meet together]: in theology, the promises recorded in the Scriptures, made by God on certain conditions of obedience, faith, etc., on the part of man. The old dispensation (or Old Testament) is called in Greek ἡ παλαιὰ διαθήκη, i. e. the old covenant; and the new dispensation (or Testament), ἡ καινὴ διαθήκη, the new covenant.

The so called "Theology of the Covenants" or "Federal System" was elaborated by Cocceius (1603–69), who taught: 1, the covenant of works before the fall; 2, the covenant of grace after the fall. And under this second covenant three economics: 1, prior to the law; 2, under the law; 3, under the gospel. This system is the theology of the Westminster Standards.

Covenant: in law, a promise under seal. There are several words appropriated to sealed instruments or promises contained in them, as bond, covenant, deed, and obligation. The first, third, and fourth words are used to express the entire instrument, while "covenant" is commonly employed to designate a particular clause in a sealed instrument. Thus there may be many covenants in a deed. The subject is fruitful in distinctions, covenants being treated in the law-books as to their form, their nature, their relation to other covenants, their assignability, and the like. One of the most important of these is that which classifies covenants into those which "run with the land" and those which do not. To explain this subject it is necessary to state that in ordinary conveyances of land there are found certain clauses which affirm in substance that the grantor is owner in possession, actual or constructive (or seized), and has a good right to convey; that there are no incumbrances on the land; that the purchaser shall quietly enjoy the land without being evicted by any person having a superior title; that the grantor will warrant and defend the title; and that he will make such further deeds or conveyances as he may be called on to make to perfect the title. In brief terms and in technical language these are covenants of seizin, good right to convey, against incumbrances, of quiet enjoyment, of warranty, and of further assurance. The first three of these, it will be observed, affirm an existing fact; the last three concern the future, and are promissory in their nature. The first three do not run with the land; the last three do. The reason of the distinction is technical. The first three, if untrue at all, are so at the very moment when the deed was delivered, and accordingly then conferred a right of action. This immediate right to sue is in the nature of personal property, and closely resembles ordinary rights of action, such as a claim on a promissory note already due. Accordingly, if the grantee in the deed should convey the land, he would not by that act alone transfer these rights of action; they would not, in technical language, "run with the land." On the other hand, as to the three covenants in the future tense, it is clear that no action can be brought upon them until the event against which they are designed to guard happens, or, in other words, until the covenant is broken—that is, until the quiet enjoyment ceases or the grantee is evicted. Until that occurs the covenant will "run with the land," by which expression is meant that the mere conveyance to the second grantee transfers these covenants, as it would the houses, trees, and other additions to land. The distinction thus pointed out also applies to the case of landlord and tenant, and there are abstruse distinctions here to be noted which can not properly be stated within the brief compass of this article. Some of the common covenants in a lease which run with the land are the agreement of the tenant to pay rent, or to make repairs, or to keep houses insured. It should be added that the rule respecting the assignabilty of covenants in leases applies to covenants binding either on the tenant or the landlord. There is a growing practice in conveyances of land in towns and cities to insert clauses binding the purchaser to use the land in a particular manner, as to build dwelling-houses upon it. Although these clauses do not strictly fall within the technical doctrines of covenants running with the land, yet they are binding in equity law on a subsequent purchaser with notice. The covenant may be enforced through the medium of an injunction or other appropriate equitable remedy.

T. W. DWIGHT.

Covenant in Restraint of Trade: See TRADE, COVENANT IN RESTRAINT OF, in the Appendix.

Covenant, National (of Scotland): an agreement to protect the Reformed religion in the Church of Scotland from the attempt of the English Government to enforce the Episcopal form of worship; drawn up and published by the Four Tables in Edinburgh Mar. 1, 1638. It professed to be based upon a document which James VI. had signed in 1580. The Four Tables, as they were called, consisted of—1, nobility; 2, gentry; 3, ministers; and 4, burgesses; and in their hands the whole authority of the kingdom was vested. They elected a general assembly which met at Glasgow in Nov., 1638, and abolished episcopacy; ordering that every person should sign the Covenant on pain of excommunication. The Covenanters prepared for war, and though a treaty of peace was concluded in June, 1639, they entered England in Aug., 1640. An agreement was signed at Ripon Oct., 1640, by which commissioners were to be appointed, to whom the points in dispute were referred. A settlement of the matter was reached, which, under the name of the Solemn League and Covenant, was received by the English Parliament of the Assembly of Divines Sept., 1643. It differed essentially from the Covenant of 1638, and, according to Hallam, "consisted in an oath to be subscribed by all sorts of persons in both kingdoms, whereby they bound themselves to preserve the Reformed religion in the Church of Scotland, in doctrine, worship, discipline, and government, according to the word of God and practice 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, directory for worship, and catechising; to endeavor, without respect of persons, the extirpation of popery, prelacy (that is, church government by archbishops and other ecclesiastical officers), and whatsoever should be found contrary to sound doctrine and the power of godliness; to preserve the rights and privileges of the Parliaments, the liberties of the kingdoms, and the king's person and authority in the preservation and defense of the true religion and liberties of the kingdoms; to endeavor the discovery of incendiaries and malignants who hinder the reformation of religion and divide the king from his people, that they may be brought to punishment; finally, to assist and defend all such as should enter into this Covenant and not suffer themselves to be withdrawn from it, whether to revolt to the opposite party or to give in to a detestable indifference or neutrality." This document was signed by members of both houses and by civil and military officers. A large number of the beneficed clergy who refused to subscribe were ejected. Charles II. signed it very reluctantly at Spey in June, 1650, in the hope of recovering the English throne. After the Restoration a majority in the House of Commons ordered it to be burned by the common hangman in May, 1661. In the same year the Scottish Parliament renounced the Covenant and declared the king supreme. The Covenanters became "Protesters" against these wrongs. Ejected from the churches they became "Conventiclers," and, later, "Hamiltonians." Under all these names they were subjected to a fierce and cruel persecution, in which neither age nor sex was spared. After the accession of William in 1688 Presbyterian government was restored in Scotland, but in the form in which it existed in 1592, thus avoiding all mention of the Covenant.

Revised by WILLIS J. BEECHER.

Covenanters: (1) the signers of the Covenant in Scotland and those who after the Restoration adhered to the Covenant. (See COVENANT.) More specifically (2), the religious body founded by Richard Cameron about 1680 (see CAMERON and CAMERONIANS), and represented by the Reformed Presbyterian churches now in existence. They claim that it is in the standards of the Covenanters that we have to look for a true embodiment of the tenets held by the great body of English and Scottish Presbyterians of 1643. Others gave in to the Revolution settlement, and afterward found cause to secede. The Covenanters never

gave in, and of course never seceded. Although in point of fact an elder sister of the existing Church of Scotland and all its secessions, the Cameronian body did not assume a regular form till after the Revolution; and it was with some difficulty that it organized a communion with ordained ministers. The steadfastness of members was put to a severe trial by the defection of their ministers, and for a time the people were as sheep without a shepherd. After sixteen years they were joined by the Rev. John McMillan, from the Established Church, in 1706. In 1743 they constituted a presbytery at Braehead, under the name of the Reformed Presbytery. Holding strictly to the Covenants, the political position of the Covenanters is very peculiar, as they refuse to recognize any laws or institutions which they conceive to be inimical to those of the kingdom of Christ. See REFORMED PRESBYTERIANS and PRESBYTERIAN CHURCH.

Revised by WILLIS J. BEECHER.

Cov'ent Garden [a corruption of convent garden, so called because it was once the garden of Westminster Abbey]: a square in the west central district of London, well known for its market for vegetables, fruits, and flowers. The square was formed in 1632 from the design of Inigo Jones, and it was first used as a market in 1656. The market consisted of an unsightly array of sheds until 1828, when the present building was erected by the Duke of Bedford, who holds under a charter granted by Charles II. It is considered one of the sights of London for a visitor, and should be seen about four o'clock on a summer's morning.

Cov'entry (Lat. *Coventria*): a city and parliamentary and municipal borough of Warwickshire, England; on the Sherbourne; 10 miles N. N. E. of Warwick; on the London and Northwestern Railway (see map of England, ref. 10–H). The modern part of it is well built. Among the remarkable buildings are St. Michael's church, founded in 1313, which is a masterpiece of the lighter Gothic style, has a spire 300 feet high, and is said to be the largest parish church in England; Trinity church; Christ church, with a handsome ancient spire, belonging to the old Gray Friars' convent from which the town has its name; and St. Mary's Hall, built about 1450, an admirable specimen of ornamental architecture. The ancient cathedral was destroyed by Henry VIII. Among modern buildings are a technical school, art school, free public library, a hospital, and a dispensary. Coventry returns one member to Parliament. It has manufactures of fringes, watches, cotton and woolen goods, and art-metal goods; is noted for its output of bicycles and tricycles, and is the greatest emporium for ribbons in England. It was formerly famous for the manufacture of broadcloth, caps, and blue thread. An annual fair, lasting five days, is held here. Coventry is a place of great antiquity, and its name appears in the *Doomsday Book* as *Couentrev*, meaning in the old British tongue "town on the Couen." In 1043 Earl Leofric and his wife, the celebrated Lady Godiva, founded here a magnificent Benedictine abbey. In the fifteenth century religious mysteries were often acted here before the king. With the exception of the period 1842–88 Coventry has enjoyed the privileges of a county since 1451. Pop. (1881) 46,563; (1891) 58,503; (1901) 69,877.

Coventry, EARLS OF: Viscounts Deershurst (England, 1689).—GEORGE WILLIAM COVENTRY, ninth earl, b. May 9, 1838; succeeded his grandfather in 1843; privy councilor; lord-lieutenant of Worcestershire, and formerly master of the buckhounds and captain of the corps of gentlemen-at-arms.

Cov'erdale, MILES: English bishop and Reformer; b. probably at Cover-dale, in Yorkshire, in 1488; was educated at Cambridge, and became an Augustine monk in 1514. He was one of the first Englishmen who adopted the doctrines of the Reformed Church of England (1526). He left the convent and became an evangelist, and then went to the Continent. In 1535 he published an English translation of the Bible, which was reissued in 1537 with the royal sanction. The version of the Psalms is that of the present Prayer-book. This was the first entire Bible ever published in English. It is not a direct translation from the original text, but only a rendering from the German and Latin versions. It has, nevertheless, great merits, and its influence on the Authorized Version, especially in rhythm and style, is easily recognized. (See BIBLE.) He edited the "Great Bible," or Cranmer's Bible (1540). In 1551 he was appointed Bishop of Exeter. On the accession of Mary in 1553 he was deprived of his office and imprisoned for a year. He was then permitted to take refuge on the Continent, whence he returned in 1558. He died in London and was buried Feb. 19, 1568. He also translated from the works of Luther, Calvin, Bullinger, and other Reformers. See his *Writings and Translations*, edited for the Parker Society (2 vols., Cambridge, 1844–46).

Covilhão, kō-vēēl-yow': a town of Portugal; province of Beira; situated among the mountains; 48 miles E. of Coimbra, and is perched like a collection of swallows' nests on the southeastern slope of Serra de Estrella, at an altitude of 2,186 feet above the level of the sea (see map of Spain, ref. 15–B). It has thermal springs, and manufactures of a woolen cloth called saragoca. Pop. (1890) 17,562.

Coville, FREDERICK V.: See the Appendix.

Covington: town; capital of Newton co., Ga. (for location of county, see map of Georgia, ref. 3–H); on railway; 41 miles E. by S. from Atlanta; is the seat of the Southern Masonic Female College. Pop. (1890) 1,823; (1900) 2,062.

Covington: city and railway junction; capital of Fountain co., Ind. (for location of county, see map of Indiana, ref. 6–B); on the Wabash river and Wabash and Erie Canal; 71 miles W. N. W. of Indianapolis; has a high school, foundry, and coal companies. Pop. (1880) 1,920; (1890) 1,891; (1900) 2,213.

Covington: city; Kenton co., Ky.: situated on Chesapeake and Ohio and the Louisville and Nashville R. Rs., and on the Ohio river opposite Cincinnati and just below the mouth of the Licking river, which separates it from Newport (for location, see map of Kentucky, ref. 2–H). The city is connected with Cincinnati by a suspension bridge and two bridges for railway and passenger traffic, and with Newport by two bridges across the Licking river. It is connected with Newport, Cincinnati, and the surrounding Kentucky territory by an electric street railway. Covington is the seat of a Roman Catholic bishopric; has numerous churches, a fine public school system, orphan asylum, hospital, rolling-mills, railroad-iron mill, manufactures of stoves, tobacco, etc., water-works, gas-works, electric light system, and numerous streets paved with asphalt. Pop. (1880) 29,720; (1890) 37,371; (1900) 42,938.

O. J. WIGGINS.

Covington: village; on railway; Miami co., O. (for location of county, see map of Ohio, ref. 5–C); 79 miles W. of Columbus. Pop. (1880) 1,458; (1890) 1,778; (1900) 1,791.

Covington: town; on railway; capital of Tipton co., Tenn. (for location of county, see map of Tennessee, ref. 7–A); situated on Big Hatchie river, 200 miles W. by S. from Nashville. It has cotton compress, fertilizer works, and saw-mills. Pop. (1880) 799; (1890) 1,067; (1900) 2,787.

Cow: See CATTLE.

Cowansville: town of Missisquoi co., Quebec, Canada; on the Yamaska river and Canadian Pacific Railway; 55 miles S. E. of Montreal. It has several mills. Pop. 1,000.

Cow Bay: a port and post-village of Cape Breton County and island; 22 miles from Sydney; has mines of bituminous coal, and a breakwater for the protection of shipping. Pop. 3,000.

Cowbird, or **Cow-bunting**: the *Molothrus ater*, a bird of the U. S. belonging to the blackbird family. The male is glossy black with a brown head, the female grayish brown. It takes its name from the fact that it associates with cattle in pastures, probably for the purpose of catching the insects which are aroused by the cattle. Like the European cuckoo, it builds no nest, but deposits its eggs in the nests of other and usually smaller birds, such as warblers and finches. As a rule but one egg is placed in a nest. The summer yellowbird is frequently victimized, but now and then outwits the cowbird by raising its nest and building over the egg of the intruder.

F. A. LUCAS.

Cowboys: marauders, mostly consisting of Tory refugees, who during the Revolution adhered to the British interests and infested the neutral ground in Westchester co., N. Y., between the American and British lines, plundering the Whigs or those who adhered to the interests of the Continental Congress. They received the name of cowboys because they stole many cattle. In the U. S. the name is now applied to men who take care of large herds of cattle in the West and Southwest.

Cowell, EDWARD BYLES, M. A.: Sanskrit scholar; b. in Ipswich, England, Jan. 23, 1826; educated at Oxford; fellow of Corpus Christi College, Cambridge; formerly principal of the Sanskrit College, Calcutta; since 1867 Professor of San-

skrit in the University of Cambridge. He is the author or editor of *The Prákrit Grammar Vararuci in Sanskrit and English* (London, 1854); *The Black Yajur Veda*, books i.–ii. (conjointly with Dr. Roer, Calcutta, 1856–64); *The Kusumánjula, or Hindu Proof of the Existence of a Supreme Being, in Sanskrit and English* (Calcutta, 1864); *The Aphorisms of Sándilya, Translated from the Sanskrit* (Calcutta, 1878); *The Sarva-darsána-samgrahá, Translated from the Sanskrit* (conjointly with Prof. Gough, London, 1882); *The Divyávandána* (conjointly with R. A. Neil, Cambridge, 1886); *The Buddha-caritá by Aśvaghosha, in Sanskrit and English* (Oxford, 1892); *The Kaushítaki Upanishad, in Sanskrit and English* (Calcutta, 1861); *The Maitri Upanishad, in Sanskrit and English* (Calcutta, 1863 and 1870). BENJ. IDE WHEELER.

Cowen, FREDERIC HYMEN: musician; b. Jan. 29, 1852, at Kingston, on the island of Jamaica, West Indies; was taken to London when very young; studied under Benedict and Goss, and then at the Leipzig and Berlin Conservatories, returning to England in 1868. Since then he has followed the profession of a composer and conductor, refusing to teach. His principal works are an operetta, *Garibaldi*; cantatas, *The Rose Maiden* (1870); *The Deluge*, *The Corsair* (1876), for the Birmingham festival; *St. Ursula* (1881), for the Norwich festival; *The Sleeping Beauty* (1885) for the Birmingham festival; the oratorio *Ruth* (1887) for the Worcester festival; the cantata *St. John's Eve* for a festival at Melbourne, Australia; the operas *Pauline* (Nov. 22, 1876), another, based on Ouida's novel *Signa*, and *Thorgrim* (Apr., 1890) for the Carl Rosa Company; five symphonies, some other orchestral pieces, and many songs and part songs. In 1888 he was appointed conductor of the London Philharmonic Society, which post he resigned about three years later. Cowen's music is exceedingly graceful and melodious, and is everywhere very popular. In 1888 he visited Melbourne, and while there produced his cantata *A Song of Thanksgiving*. D. E. HERVEY.

Cowes, West: a seaport and watering-place of England, on the Isle of Wight; at the mouth of the river Medina; 10½ miles S. S. E. of Southampton (see map of England, ref. 14–I). It is built on a steep slope, presenting a fine appearance from the sea; contains many elegant villas and hotels, has an active coasting trade, and is a general rendezvous for yachtsmen in the yachting season. It is the chief port of the island. Pop. (1891) 10,648.

Cowhage (sometimes called **Mucuna**): a drug which consists of the hairs of the pods of *Mucuna pruriens* (of the family *Leguminosæ*), a long twining plant with large trifoliate leaves and dark-purple or dark-greenish flowers, and largely cultivated in both the East and the West Indies. The hairs are about one-eighth of an inch long, and of a glossy-brown color. They easily penetrate the skin and produce an intolerable itching, which instead of being relieved by washing or rubbing is greatly increased. Very little is known of the chemical composition of the drug. It was originally employed as a vermifuge, but is now very little used. At one time it was made into an ointment and used as a counter-irritant to the skin of limbs which were suffering from paralysis, but this treatment can not only be of no value, it may be distinctly harmful by irritating the surface of limbs which are already in a condition of bad nutrition. H. A. H.

Cowl [O. E. *cuhle*, from Lat. *cucullus*, hood]: originally simply the hood which the monk draws over the head in order to prevent the eyes from glancing either right or left, and thus shut himself up in solitude even while among the multitude; but, as the cowl is the most characteristic part of a monk's dress, the word came in course of time and by an easy transition to mean the whole monastic garment.

Cow'ley, ABRAHAM, M. D.: English poet; b. in London in 1618; entered Trinity College, Cambridge, in 1637. His love for poetry was aroused by reading *The Faery Queen*, and he began to write at an early age, publishing a volume of poems called *Poetic Blossoms* when fifteen years old. He was ejected from college as a royalist in 1643, and removed to Oxford, where he continued his studies. In 1646 he went to Paris with the queen, and remained ten years. He published in 1647 *The Mistress*, a series of poems which abound in frigid conceits. In 1656 he returned to England, was imprisoned as a royalist, but was released through interest, and obtained the usufruct of one of the queen's estates, £300 yearly. From 1658 to 1660 he again lived in Paris. He studied natural history, and issued *Liber Plantarum* (1662–78). The epic *Davideis*, commenced in college, was never finished. His essays, as well as his anacreontics, evidence sensibility and refinement of thought, a facile imagination, a brilliant wit, and cultured mind, but are marred with the prevailing trivial love for glittering ingenuity of style. The most admired poet of his day, he is called on his tombstone "Anglorum Pindarus, Flaccus et Maro." His works were published by Sprat (1680), by Aikin (3 vols., 1802), and by Grosart (1881). D. in London, July 28, 1667. He was buried in Westminster Abbey, beside the remains of Chaucer and Spenser, where the Duke of Buckingham erected a monument in 1675. Cowley holds a high position as a prose-writer and an essayist.

Cow-parsnip: a large herbaceous plant of the genus *Heraeleum* of the family *Umbelliferæ*, or UMBELWORTS (*q. v.*), natives of the northern hemisphere and chiefly of the temperate regions of the Old World. The plants of this genus are characterized by their strongly flattened fruits, conspicuous white flowers in broad umbels, borne upon tall branching large-leaved stems, the leaves ternately compound. About fifty species are recognized by botanists. *Heraeleum lanatum* is the only North American representative. It occurs from Newfoundland and Labrador to British Columbia and Alaska southward to North Carolina, Kentucky, Texas, and California, and its fruit is said to be eaten by some of the native tribes. In the Old World it occurs in Japan and Siberia. It is a tall-growing woolly plant from 4 to 8 feet high, with a grooved stem and broad irregularly cut toothed leaflets. It is said to possess poisonous qualities. C. E. B.

Cowpen-bird: same as COWBIRD (*q. v.*).

Cow'pens: a village of Spartanburg co., S. C.; about 100 miles N. N. W. of Columbia. Pop. (1900) 692. Here Gen. Morgan defeated a British force under Col. Tarleton, Jan. 17, 1781. The British lost 300 killed and wounded; the Revolutionary force took 500 prisoners, 2 cannons, 800 muskets, and 2 standards, and had 12 killed and 60 wounded.

Cowper (properly pronounced "Cooper"), EARLS: Viscounts Fordwich (Great Britain, 1718), Barons Cowper (England, 1706), Barons Butler of Moore Park (England, 1679), Barons Dingwall (Scotland, 1607), and baronets (1642).—FRANCIS THOMAS DE GREY COWPER, seventh earl, a prince of the Holy Roman Empire, captain of the corps of gentlemen-at-arms; b. June 11, 1834; succeeded his father Apr. 15, 1856; from 1880–82 Lord-Lieutenant of Ireland.

Cowper, WILLIAM, Earl: English judge and orator; b. in 1664. He was called to the bar in 1688, and elected to Parliament in 1695. He became an excellent debater and the leader of the Whig party in the House of Commons. In 1705 he was appointed Lord Chancellor. He resigned the great seal when the Tories obtained power in 1710, but was reappointed in 1714. Having resigned office in 1718, he was then created an earl. D. Oct. 10, 1723.

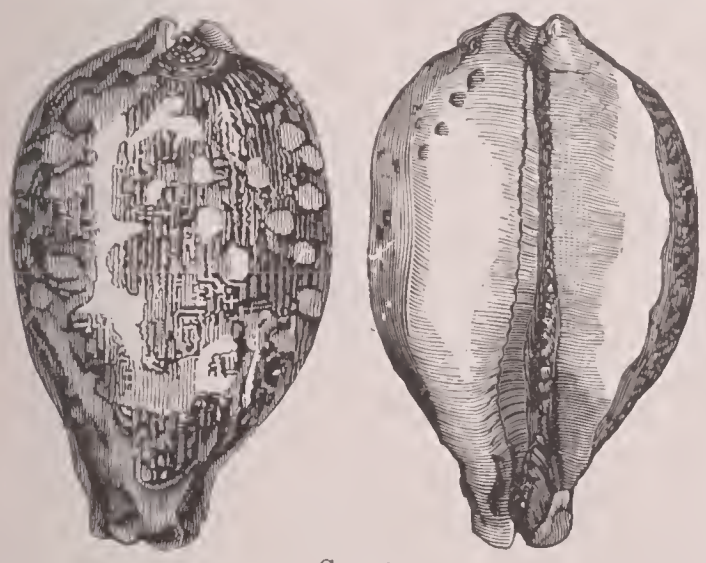
Cowper, WILLIAM: English poet; b. at Great Berkhampstead, Hertfordshire, Nov. 15, 1731; the son of the rector, John Cowper, chaplain of George II., and nephew of Earl Cowper. Deprived of his mother at the age of six, he was a tender, shrinking child, and a sensitive, melancholy boy at Dr. Pitman's school, made more so by the rough fagging at Westminster School, where he advanced in classical studies. First articled to an attorney, living in the Temple in 1752, and called to the bar in 1754, he never practiced. Appointed clerk of the journals in the House of Lords (1763), he could not bring himself to appear for nervousness. He determined on suicide, but wanted courage. Morbidly dejected, he was taken in Dec., 1763, to the private asylum of Dr. Nathaniel Colton at St. Albans, where he spent a couple of years, and then went to Huntingdon, where he came to know Mrs. Unwin, "Mary" in his poems. The acquaintance grew into a tender friendship, and ultimately to an engagement of marriage, her husband dying in 1767. Residing with the Unwins amid gentle and religious influences, where his spirit found repose and ease, he came to be intimate with their friend, Rev. Mr. Newton, whose employment of him as a kind of lay curate may have had the effect to bring back his mental malady. In 1773 he became insane again, and so all thought of marriage with Mrs. Unwin had to be abandoned. Tended by Mrs. Unwin through a long illness, in his convalescence he translated the hymns of Madame Guyon, and diverted himself with taming hares. Mrs. Unwin suggested a poem on the *Progress of Error* in Dec., 1780, and in three months he wrote *Truth*, *Table-talk*,

Progress of Error, and *Expostulation*, published in 1781. Lady Austen, whom he met in 1781, inspired him to write *The Task* (1783), and to translate Homer (1791), and first told him the story of John Gilpin (1782). *The Task* met with great success. In his later life Cowper became more and more the prey of dejection and remorse, which sometimes deepened into insanity. His *Private Correspondence* (2 vols., 1824) is gentle, thoughtful, and pervaded with playful humor. Cowper gave to English taste a simpler and more earnest cast. D. at East Dereham, Norfolk, Apr. 25, 1800. The best edition of his works is Southey's (15 vols., 1837–38), reprinted in Bohn's Library. See the *Lives* in Southey's edition, that of Hayley, and especially by Thomas Wright (London, 1892). Revised by S. M. Jackson.

Cowper's Glands: two small and rather lobulated yellowish glands which in the male of the human species are found between the layers of the deep perinæal fascia, under the anterior part of the membranous portion of the urethra. They secrete a mucus which flows into the bulbous portion of the urethra by a duct an inch long. The vulvo-vaginal glands (glands of Bartholine) are the analogues in the female.

Cowpox Inoculation: a species of inoculation, as a security against the smallpox; introduced by Dr. Jenner. It became general in 1799. The genuine cowpox appears in the form of vesicles on the teats of the cow. It was first brought into use by Jenner, who first vaccinated from arm to arm in 1796. He had been studying and experimenting about it for a number of years before. See Inoculation and Vaccination.

Cowry [sometimes *Courie*, representing *kaurī*, the Hindustani name]: a common name for the shells of the genus *Cypræa*, a group of ctenobranchiate mollusks, often termed porcelain shells from their smooth, polished appearance. The shells are spiral and convoluted, but the spire is concealed in the adult by the great development of the body whorl, so that the shell has a more or less oval outline, notched at either end. Moreover, the outer lip is bent inward, and the lips toothed. The foot is broad, the mantle expanded, and turned up over the shell where it secretes the enamel. Many



Cowry.

of the cowries are beautifully marked with rich colors, others are quite plain. There are something like 200 species, the majority being from the Indian and Pacific Oceans. They keep near shore and are most abundant about low-water mark. One small species, *Cypræa moneta*, is still used as a medium of exchange in parts of Africa, and it was formerly employed in such vast numbers that in one year no less than 300 tons were brought to Liverpool for the African trade. In Bengal it required over 5,000 cowries to equal one rupee (a silver coin which has varied in value from fifty cents down to twenty-eight or thirty cents), and yet the annual importation was in the vicinity of $100,000. Cowries are believed to have been used by the Assyrians, as specimens were found at Nineveh by Layard, but whether for ornamentation or as money is not known.

F. A. Lucas.

Cowslip: the common name in Great Britain of a variety of the native primrose (*Primula officinalis*), a low-growing herbaceous perennial, with ovate or oblong, slightly toothed radical leaves, which form a rosette or cluster at the ground. The flower-stalk rises from the leaf cluster and bears a few-flowered umbel of small yellow flowers. The species is separated into three races as follows: (1) flower-stalk one-flowered, *Primrose*; (2) flower-stalk bearing several umbelled small flowers, *Cowslip*; (3) flower-stalk bearing several umbelled large flowers, *Oxlip*. In the U. S. the *Dodecatheon meadia* is the American cowslip, and the name is applied also to Caltha (*q. v.*). C. E. B.

Cow-trees: trees of the tropics whose milky juice (*latex*) is used as human food. They are found in separated families, and have in some cases no close relationship with one another. In all cases, however, the milky product is derived from certain cells or tissues found in the stems, and is not, as is popularly supposed, the proper juice of the plant. These milk-vessels, or as they are known in botany, the *laticiferous* vessels, are described in the article Histology, Vegetable (*q. v.*). It is necessary here only to say that the laticiferous vessels of plants are generally continuous tubes lying in the midst of other tissues, and that they contain a white, red, yellow, or almost transparent fluid in which starch granules and various alkaloids are usually present. In the Poppy (*q. v.*) the latex contains opium, while in some figs and related trees it contains caoutchouc. In many cases the alkaloids are harmful or even virulently poisonous, but in the cow-trees the latex is wholesome, and is much used by the natives of the regions where the trees abound. The best known of these trees is the *Brosimum galactodendron*, a near relative of the bread-fruit tree of the family *Urticaceæ*, a tree 80 to 100 feet in height, of the forests of Guiana. The latex flows copiously from incisions made in the trunks, and is used in the place of cow's milk by both natives and Europeans. C. E. B.

Cox, David: English landscape-painter; b. at Deritend, a suburb of Manchester, Apr. 29, 1793; son of a blacksmith; studied drawing, and became a scene-painter; in 1804 removed to London, where he studied under John Varley; in 1813 became a member of the Society of Painters in Water Colors; for several years taught drawing in Hereford and elsewhere; from 1827 to 1841 resided in London; then made Harborne, near Manchester, his home, and died there June 15, 1859. He left above 100 paintings in oil-colors, but is best known as a water-color painter, and as such is one of the most noted in the history of English art. His works in water-colors are very numerous, and are characterized by simplicity, pure and brilliant color, and faithfulness to nature, especially her atmospheric effects. Among them are the oil-paintings *Peace and War* (1846) and *The Church of Bettws-y-Coed*, and the water-colors *Ulverston Sands* (1835) and *Bolton Abbey* (1849). He wrote a *Treatise on Landscape-painting and Effect in Water-colors* (1814).—His son, David Cox (1809–85), was a water-color painter of some note.

Cox, Sir George William, Bart., M. A.: Greek scholar; b. 1827; educated at Rugby and at Trinity College, Oxford; since 1881 rector of Scrayingham, Yorkshire. Author of many works on history and mythology, especially of Greece, including *Tales of the Gods and Heroes* (1862); *Tales of Ancient Greece* (1868); *Latin and Teutonic Christendom* (1870); *The Mythology of the Aryan Nations* (2 vols., 1870); *Introduction to the Science of Comparative Mythology and Folklore* (1881); *Lives of Greek Statesmen* (2 vols., 1886). Author also of *Poems, Legendary and Historical* (1850); *Life of John William Colenso* (1888); *The Church of England and the Teaching of Bishop Colenso* (1888). He contributed many articles to the ninth edition of the *Encyclopædia Britannica*. In 1891 he was chosen to the see of Natal by the followers of the deposed Bishop Colenso, but refused consecration by the Archbishop of Canterbury and the English bishops. William Stevens Perry.

Cox, Jacob Dolson, LL. D.: statesman; b. in Montreal, Canada, Oct. 27, 1828. His parents were natives of the U. S. The family removed to Ohio, where he studied at Oberlin College, and was admitted to the bar. In 1859–61 he was a member of the State Senate. He became a major-general of Union volunteers in the autumn of 1862, and served under Gen. Sherman in Georgia in 1864. In December of that year he commanded a division at the battles of Franklin and Nashville. He was elected Governor of Ohio by the Republicans in Oct., 1865, held that office two years, and was appointed Secretary of the Interior in Mar., 1869. He resigned in Nov., 1870; was representative in Congress 1877–79. He became dean of the law school of Cincinnati University in 1881, and president of that university in 1885. D. Aug. 4, 1900.

Cox, Kenyon: figure-painter; b. at Warren, Ohio, Oct. 27, 1856; son of Jacob D. Cox; pupil of Gérôme and Carolus-Duran, Paris; second Hallgarten prize, National Academy, New York, 1889; two third-class medals, Paris Exposition, 1889; Temple silver medal, Pennsylvania Academy, Philadelphia, 1891; member of the Society of American Artists (1882); honorary member and instructor Art Students League; member Architectural League, New York. He began his art studies in Cincinnati; worked after that for a time in Philadelphia, and went to Paris in 1877. He is one of the best of American draughtsmen, and frequently paints pictures of the nude figure. His portraits are notable for simple arrangement and fine technical qualities. Some of his best works are *Jacob Wrestling with the Angel*; *Portrait of Augustus St. Gaudens*; *Vision of Moonrise*; *Blonde*; *Flying Shadows* (a landscape); and *Painting and Poetry*, a large decorative composition. He is a prolific and talented illustrator. His designs for *The Blessed Damozel*, by Dante Gabriel Rossetti, are justly ranked with the best illustrative work of the day. His drawing of the human figure is generally marked by simplicity, and he has a strong feeling for style; more distinguished as a draughtsman than as a colorist, his work is by no means deficient in the latter quality, and in some of his pictures the chief charm lies in the color scheme and the artistic harmony with which it is expressed. He is a vigorous and able writer of criticisms and reviews. Studio in New York. William A. Coffin.

Cox, Melville Beveridge: the first Methodist Episcopal foreign missionary; b. at Hallowell, Me., in 1799; entered the ministry in 1822, and sailed as missionary to Liberia Nov. 3, 1832. Here he labored with great zeal and success for some months. He died of "African fever" July 21, 1833.

Cox, Palmer: See the Appendix.

Cox, Richard: Bishop of Ely; b. in 1499; was the tutor of King Edward VI. He translated for the Bishop's Bible the four Gospels, the Acts, and the Epistle to the Romans. D. July 22, 1581.

Cox, Samuel, D. D.: General Baptist; b. in London, England, Apr. 19, 1826; graduated at the Stepney Baptist Theological College, London, 1851; was pastor in Nottingham from 1863 till his death at Hastings, Mar. 27, 1893. He founded *The Expositor* in 1875, and edited it till 1884 with marked ability, but his advocacy of Restorationism compelled his resignation. He was the greatest of modern English Bible expositors, as distinguished from exegetes. His principal publications are *The Quest of the Chief Good*, a commentary upon Ecclesiastes (London, 1865; 2d ed. 1890); *The Private Letters of St. Paul and St. John* (1867); *The Pilgrim Psalms* (1874); *Ruth* (1875); *Salvator Mundi* (defense of Restorationism) (1877; 11th ed. 1888); *Job* (1880; 2d ed. 1885); *The Larger Hope, a Sequel to Salvator Mundi* (1883); *Balaam* (1884).

Cox, Samuel Hanson, D. D., LL. D.: Presbyterian author and divine of Quaker parentage; b. in Rahway, N. J., Aug. 25, 1793; was ordained July 1, 1817. He was pastor of the Spring Street church, New York (1820–33), Professor of Sacred Rhetoric at Auburn Theological Seminary (1834–37), and pastor of the First Presbyterian church, Brooklyn, N. Y. (1837–54). He was an early and eminent advocate of temperance, anti-slavery, and other reforms. He wrote *Quakerism not Christianity* (New York, 1833). D. Oct. 2, 1880.

Cox, Samuel Sullivan, LL. D.: b. at Zanesville, O., Sept. 30, 1824; graduated at Brown University in 1846; was a Democratic member of Congress from Ohio 1857–65, and from New York city 1869–85. He was a well-known lecturer, and in addition devoted much time to literature. He published *Eight Years in Congress* (1865); *Why We Laugh* (1876); *Three Decades of Federal Legislation* (1885); *The Diversions of a Diplomat in Turkey* (1887), etc. Became U. S. minister to Turkey in 1885; resigned 1886; re-elected member of Congress from New York in 1886 for unexpired term of J. Pulitzer, and for 1887–89; re-elected Nov. 6, 1888. D. Sept. 10, 1889.

Cox, William Van Zandt: See the Appendix.

Coxal'gia [Lat. *coxa*, hip + Gr. ἄλγος, pain], or **Coxi'tis** (technically known as *Morbus coxarius*, or hip-joint disease): an inflammation of the hip-joint, sometimes very rapid, more often slow and insidious, which may begin either in the head of the thigh-bone or the socket of the hip-bone, or else in the membrane (*synovial*) that lines its cavity, but which finally extends to all its tissues, cartilages, ligaments, and surrounding soft parts. Inflammation of the bones (*osteitis*), by far the most common origin of the disease in children, is usually chronic and insidious in its development, and is favored by the incomplete ossification and active nutrition of the bones in childhood. Inflammation of the lining membrane (*synovitis*) is a not infrequent form of hip disease in adolescence and adult age. Chronic infantile coxitis principally affects children between one and five years of age, and is often awakened by a fall or blow, especially when such accident occurs to children of a tuberculous or scrofulous constitution. The first symptom is lameness, followed by pain, first felt in the knee, afterward excited in the joint itself by direct pressure, by motion of the limb, or by the weight of the body resting upon it. To lessen this weight the patient rests on the ball of his foot, and drags the leg in walking, stiffly extending it. At this stage it is turned a little outward by spasmodic contraction of the muscles on the outer side of the joint. But very soon, in order to still further lessen the weight, the body bends over on the thigh, and the arm and lame part of the back, with the abdomen, are carried forward. When the patient lies down, therefore, a space is left between the body and the bed, and if the spinal column be forcibly straightened out and the curve flattened, the thigh in turn is bent on the body by contraction of the muscle that runs from the spinal column to the neck of the thigh-bone (*psoas*). Still, for the purpose of lessening weight, the hips are tilted toward the painful side, and appear oblique, while the leg is thus apparently lengthened. Behind, the nates are flattened. It soon becomes impossible to move the head of the thigh-bone in its socket; the whole hip moves with every motion communicated to the leg. This sign is most characteristic of the confirmed disease; it is due at first to the spasmodic rigidity of muscles—later to inflammatory adhesions.

In the second stage the amount of serous fluid in the joint cavity is increased, the thigh is more strongly bent on the body (flexed), and drawn inward (adducted), so that the foot crosses the opposite leg. The affected limb is therefore apparently shortened. Swelling may appear in the groin and at the outer aspect of the thigh; the pain becomes severe; standing and walking are difficult.

In the third stage the cavity fills with matter or "pus," the ligaments of the joint are relaxed, abscesses form in the neighborhood, and all the soft parts are swollen by inflammatory exudations. Dislocation occasionally, though rarely, occurs. Sometimes the head of the thigh-bone separates from its shaft, and adheres to the socket of the joint, while the socket itself is enlarged. The patient's strength is severely undermined, hectic fever sets in, the emaciation is extreme, and death may occur gradually from exhaustion, or more rapidly from acute absorption of poisons produced by pus.

The diagnosis of *morbus coxarius* is only difficult in the first stage. The lameness may simulate that of muscular paralysis, from which it is distinguished by the freedom with which the head of the thigh-bone may be moved; or the pain in the knee may fix suspicion on the wrong joint; or the thigh may exactly imitate hysterical muscular contraction; but in this affection the limb relaxes completely under chloroform.

The prognosis for spontaneous cure is always very unfavorable. After suppuration death may be caused by pyæmia, by exhaustion, by general tuberculosis, or by amyloid disease. Appropriate treatment of the first and second stages offers about 50 per cent. of recoveries; operative treatment of the third stage has so far cured about one-half of the cases submitted to it. In a large number of cases, although the inflammation is arrested, and hence life is saved, the joint becomes permanently immobilized (ankylosis) by fibrous bands within and around its cavity, that hold the articular surfaces firmly together (false ankylosis). This result is to a certain extent favored by the treatment adopted for the cure of inflammations; it is important therefore that the stiffened limb be left in the most favorable position for use—namely, extension.

The treatment varies according to the stage of the disease. During the primary osteitis that so often precedes inflammation of the joint, and is indicated by the one symptom of lameness, constitutional treatment is to be adopted—cod-liver oil, iron, cinchona, nourishing food, fresh air, and salt-water bathing. As soon as the movements of the joint are compromised, local treatment becomes of primary importance. It aims—1, to immobilize the joint, so as to prevent friction of the inflamed parts; 2, to extend the limb, so as to overcome the tension of the spasmodically contracted and shortened muscles, and to separate as much as possible the

folds of the lining membrane, to reduce to a minimum size the cavity of the joint, and thus favor the reabsorption of fluids; finally, to leave the limb in the best position for use should it become permanently stiffened. The limb can only be maintained in extension by a force sufficient to overcome these spasmodic muscular contractions. Many apparatuses are devised for this purpose, in which the limb is straightened out and fastened to an inflexible plane, and forcibly retained in this position by means either of a weight attached to the foot or a sliding screw at the knee. The simplest form of apparatus is made by swathing the limb in bandages stiffened by plaster-of-Paris or dextrin. These are only adapted to the earliest stage, or when cure is already progressing. It enables the patient to walk about. This facility is also afforded by steel apparatus that supports the limb at the waist and foot, and gradually extends it by continued traction at the knee. In other cases the patient is kept in bed, the leg fastened to a simple long splint, with a cross-piece under the foot, to which is attached a weight. A large double gutter, in which were laid the entire pelvis and both lower extremities of the patient, was formerly famous, but is now seldom used. Other methods, as by external application of blisters or ointments, or repeated blisterings, or by the use of the cautery, formerly much in vogue, are now generally condemned.

When suppuration has occurred within the joint, or even when there is any thickening of the upper end of the femur, or of the joint structures, and especially when pus has discharged externally by one or more fistulæ, it is necessary to amputate (resect) the head of the thigh-bone. Very extensive destruction of the hip-bone and certain general diseases, amyloid disease or general tuberculosis, with incoercible diarrhœa, contra-indicate the operation. After it, death may result from such complications or from surgical fever (pyæmia, septicæmia). When successful, however, the patient is rescued from an otherwise certain death, and the joint recovers a certain degree of function, with some shortening of the limb, nevertheless with very great usefulness; ankylosis being much less frequent than after treatment by immobilizing apparatus.

MARY C. PUTNAM JACOBI.
Revised by ROSWELL PARK.

Coxe, ARTHUR CLEVELAND, D. D., LL. D.: clergyman and author; son of Dr. Samuel H. Cox; b. at Mendham, N. J., May 10, 1818; graduated at University of New York in 1838, and at the General Theological Seminary of the Protestant Episcopal Church; took holy orders in 1841. He wrote, besides other works, *Christian Ballads* (1840); *Athanasian and Other Poems* (1842); *Saul, a Mystery, and Other Poems* (1845); *Thoughts on the Services*; *Impressions of England* (1856), etc. He became rector of Calvary church New York in 1859, and Bishop of Western New York in 1865. D. at Clifton Springs, N. Y., July 20, 1896.

Coxe, REGINALD CLEVELAND: son of Bishop A. C. Coxe; marine painter; b. in Baltimore, July 21, 1855. Pupil of Bonnat, Paris; member of Society of American Artists (1888) and Architectural League, New York. His pictures of the sea are fresh in their impression of nature. He is also an etcher of ability. Studio in New York. W. A. C.

Coxe, TENCH: political economist; b. in Philadelphia, Pa., May 22, 1755; during the Revolution was at first a royalist, but later turned Whig; member of the Continental Congress in 1788. He labored in behalf of manufactures in the U. S., and was especially prominent in urging the introduction of the cotton industry in the South. Among his works are *An Inquiry into the Principles of a Commercial System for the United States* (1787); *View of the United States* (1787–94); and *On the Navigation Act* (1809). D. in Philadelphia, July 17, 1824.

Coxe, WILLIAM: an English historian; b. in London, Mar. 7, 1747. He was appointed curate of Denham in 1771. He published, besides other works, *Travels in Russia, Poland, Sweden, and Denmark* (1784); a *History of the House of Austria* (1792); *Memoirs of Sir Robert Walpole* (3 vols., 1798); and *Memoirs of the Kings of Spain of the House of Bourbon, 1700–88* (1813). He became Archdeacon of Wilts in 1805. D. at Bemerton, June 16, 1828.

Coxsackie, kŏŏk-saw'kĕ: village; Green co., N. Y. (for location of county, see map of New York, ref. 6–J); on West Shore and N. Y. C. and H. R. railways; 21 miles S. of Albany; has a public school, large valve-factory, fire-hydrant factories, shirt-factory, brick-works, and large ice-houses. Pop. (1880) 1,661; (1890) 1,611; (1900) 2,735.

EDITOR OF "NEWS."

Coyo'te (native Mexican *coyotl*): the small barking or prairie wolf, *Canis latrans*, abundant in the Western and Southwestern U. S. and parts of Mexico. See WOLF.

Coypel, NATALIS, or NÖEL: painter; b. in Paris, Dec. 25, 1628. He studied in Orleans under Poncet. At the age of fourteen he returned to Paris, studying with Guillerie, and then with C. Errard, who presented him to the king. At eighteen he was commissioned with the decorations for *Orpheus*, and from that time was always employed by royal patrons. In 1655 he painted in the Louvre the oratory and the king's apartment, also that of Cardinal Mazarin. He painted the ceilings of the queen's room for the marriage of Louis XIV., also the magnificent saloon of machinery in the Tuileries, besides many works at Fontainebleau. He married, at thirty-one, Magdalen, daughter of Kirault, and was received into the Royal Academy of Painting in 1663. In 1660 Coypel decorated the king's apartment at the Tuileries. He was afterward sent to Rome as director of the French Academy, and spent four years there, during which time he produced his pictures of *Solon*, *Trajan*, *Alexander Severus*, and *Ptolemy Philadelphus*. He was recalled to Paris to succeed Mignard as first painter to the king and permanent director of the Academy. Here he remained till his death. D. Dec. 24, 1707.

W. J. STILLMAN.

Coy'pu: a large South American rodent (*Myopotamus coypus*) of the family *Octodontidæ*, resembling in its appearance a huge house-rat. It attains a length of over 3 feet. The fur is long, under fur thick and soft; upper parts dusky, penciled with brownish yellow; sides and under parts brownish yellow in general hue; tip of muzzle and chin white. The coypu is the only species of the genus. It is found from Eastern Brazil southward, occurring on both sides of the Andes. Ordinarily it is a resident of streams and rivers, but in some localities dwells on the coast, making its burrows in the woods a short distance from the shore. It was formerly exported in large quantities for fur, known in the U. S. as *nutria*, the Spanish name for otter. F. A. L.


Coypu.

Cozumel' (in Maya, *Coyumil*): island off the east coast of Yucatan; separated from the mainland by a deep channel 9 miles wide. Length from N. to S., 24 miles; width, 7 miles. It is low and flat, and bordered by reefs; the surface is covered with low trees and bushes, and is partly marshy. Cozumel was discovered by Grijalva, May, 1518, and visited by Cortés in 1519. It was then inhabited by Maya Indians, and remains of their temples and houses still exist (see CENTRAL AMERICAN ANTIQUITIES). It has a small village or pueblo at the northwest angle, called San Miguel, but the most of the island belongs to the hacienda of San Marin, and is devoted to cattle-raising. The island is surrounded by a dangerous coral reef, and has no port.

HERBERT H. SMITH.

Coz'zens, FREDERICK SWARTWOUT: writer; b. in New York, Mar. 5, 1818; was a wine-merchant. He contributed to the *Knickerbocker Magazine* and *Putnam's Magazine*, and for many years published a periodical connected with his business and called the *Wine Press*, in which he wrote interesting articles on grape cultivation and wine-making. Among his works are *Prismatics* (1853); *Sparrowgrass Papers* (1856); *Acadia: or a Sojourn among the Bluenoses* (1858); and *Stone House on the Susquehanna*. D. Dec. 23, 1869.

Crab: the common name of various arthropodous animals, most of which belong to the brachyurous DECAPODA (*q. v.*). Over 1,000 kinds of true crabs are known, most of which have no common names. The following are the best known:

Fiddler Crab.—Species of the genus *Gelasimus*, characterized by having a rhomboid body, and in the male one pincer enormously developed so that it is likened to a violin. Fiddler crabs are amphibious, and live in large colonies in holes in the seashore in the warmer parts of the world. Some forty or fifty species are known.

Hermit Crab.—Anomurous decapods of the family *Paguridæ*, genera *Pagurus*, *Diogenes*, etc., in which the abdomen is not hardened, and hence is exposed to injury. To protect itself the crab inserts its hinder body into the cavity of some cast-off snail-shell, which, held in position by the modified legs of this region, is carried about by the crab.

At the approach of danger the crab retracts itself entirely into the shell, closing the opening by the hard pinching

Hermit crab (in shell).

Hermit crab (without shell).

claws. Hermit crabs occur in all the seas of the world, some living on the shore, others in deep water.

The *Lady Crab* is the *Platyonichus ocellatus* of science. It has a circular body, with flattened feet, and is ornamented by small circles of darker color.

There are several species of *land crabs* in the tropics, mostly belonging to the genera *Uca* and *Gecarcinus*. They have heart-shaped bodies and long legs. They live mostly in the forests, only going to the sea to lay their eggs. When abundant they can cause considerable damage to fields of sugar-cane and the like, as they are largely vegetarians in their diet.

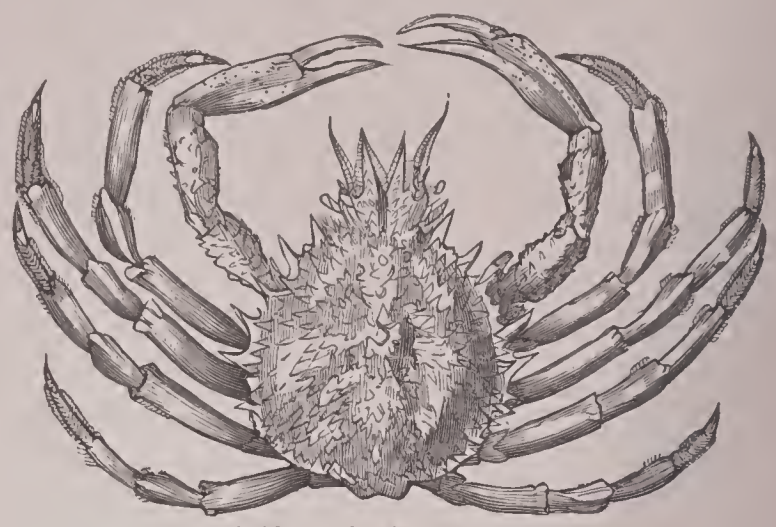
The *Oyster Crab* (*Pinnotheres ostreum*) is a small round crab with thin shell and weak legs, the female of which spends its life inside the shell of the oyster, while the male is but rarely found in such places. The name *Pinnotheres* (pinna = guardian) was given to another similar crab which lives in the pinna-shell, under the belief that it lived here as a guardian to the mollusk, warning it of the approach of danger and telling it when to close the shell. It is hardly necessary to say that its choice of a home is made for protection.

The *Palm Crab* (*Birgus latro*) of the East Indies is a near relative of the hermit crabs, but unlike them it never protects its abdomen with a shell. It is a large form, weighing

Palm crab: *Birgus latro.*

sometimes 20 lb. It lives in holes in the ground which it lines with the fiber of the cocoanut. It is said by some to climb the palm-trees for the cocoanuts on which it feeds; others say it eats only the nuts which fall to the ground. These it opens by boring into the "eyes" and then breaking the shell with its stout claws. Especial interest centers in the palm crab from the fact that it has developed, as a result of its terrestrial life, a spongy organ distinct from the gills which functions as a lung, although, of course, it has no homology with the lungs of the vertebrates.

The *Porcelain Crabs* (*Porcellana*) are small tropical crabs with very hard, brightly colored, and highly polished shells, resembling porcelain.



Spider crab: *Maia squinado.*

The *Rock Crabs* (*Cancer*, etc.) live among the rocks, and are usually large and strong forms, the common rock crab

Spider crab: *Parthenope horrida.*

of California (*Cancer magister*) measuring 2 feet across. All have elliptical shells, the edges being frequently toothed and the body brightly colored.

The swimming crab.

The *soft-shelled* crabs of the markets are members of the group of swimming crabs (*Portunidæ*), in which the body is produced on either side into a long sharp spine, while the hinder feet are flattened into an oar. Like all crabs, these swimmers periodically cast the old shell, and, when taken before the new shell is hardened, they form the soft-shelled crabs of the table. Thus it is evident that it is not so much a species as a condition which constitutes the soft shell; still on the east coast of America *Neptunus hastatus* is the crab most usually employed. When the shell has become hardened the species is commonly known as the *blue crab*.

Many hundred species of small-bodied, long-legged crabs (*Maioidea*) are known as spider crabs. Some of these occur in Arctic seas, but the majority are tropical. As a group they are of considerable interest, especially from the way in which they attach seaweed and sedentary animals to the shell as a means of concealment. To this group belongs the largest crab known, the *Macrocheira* of Japan, which will sometimes measure across the outspread legs as much as 12 feet.

Most crabs act as scavengers, eating up decaying animal and vegetable matter which they find in the sea. In turn, all of them which are large enough are valuable as food, although, excepting the soft-shelled forms, they are largely neglected as a food supply. See CRAB-FISHING.

J. S. KINGSLEY.

Crab-apple (*Pyrus coronaria*): a small tree growing wild in the U. S., bearing rose-colored fragrant blossoms and fragrant greenish fruit, which is prized for preserves. Another wild crab-apple, the *Pyrus angustifolia*, also grows in the Southern States. The cultivated crab-apple is the *Pyrus baccata*, a native of Siberia. (See APPLE.) The term is commonly used to denote any small and sour hard apple which is fit only for culinary purposes.

Crabbe, GEORGE: poet; b. in Aldborough, Suffolk, England, Dec. 24, 1754. He learned the profession of surgeon, which he soon renounced. He went to London in 1780, and soon produced *The Candidate*, an unsuccessful poem, and was reduced to extreme poverty, from which he was relieved by the generosity of Edmund Burke, who received him as an inmate in his own house, and secured the publication of *The Library* by Dodsley (1781). Having taken holy orders in 1782, he became chaplain to the Duke of Rutland at Belvoir Castle, and married Miss Sarah Elmy. His reputation was increased by *The Village*, a poem (1783). He became curate of Strathern in 1785, and obtained the living of Trowbridge, in Wiltshire, in 1813. Among his works are *The Parish Register* (1807), *The Borough* (1810), and *Tales in the Hall* (1819). He was distinguished for his vigor and the "Chinese accuracy" of his observation. D. Feb. 8, 1832. See *Life of George Crabbe*, by his son (1838); also Kebbel, *Crabbe* (1888).

Crab-fishing: crabs are extensively used for food, and among the many edible species may be mentioned the great crab of Europe (*Cancer pagurus*), the closely related *Cancer magister* of the Pacific coast of the U. S., the European stone crab (*Carcinus mœnas*), the West Indian land crab (*Gecarcinus ruricola*), and pre-eminently the blue crab (*Callinectes hastatus*) of the Atlantic coast of the U. S. Crabs are caught in shallow water with dip nets, or in some instances by poking them gently with a pole, which they seize with their strong front claws, and allow themselves to be drawn sufficiently near the surface to be dipped up. Many, especially those dwelling at moderate depths, are taken in crab-pots, wicker or network traps baited with fish or offal, while others are caught in shallow hoop-nets, these being coarse-meshed nets, something like a deep pudding-dish in shape. A boat carries a dozen of these nets, which have the bait tied to the center, and are lowered to the bottom, so as to lie quite flat. When there is reason to suppose that there are crabs in a net, it is pulled so swiftly and steadily to the surface that the occupant can not escape. On the Atlantic coast the blue crab is captured on hand-lines baited with meat, fish, or the refuse of dressed fowls. The crabs cling to the bait until it is near the surface, when they are promptly scooped up with coarse-meshed dip-nets. Trawls, or trot-lines, are sometimes used, these being lines from 200 to 1,200 feet long, having shorter lines bearing bait suspended from them at short intervals. These lines are either anchored or, as in Louisiana or Texas, where the longest lines are used, set from the shore. In the former case the fisherman "under-runs" the line at frequent intervals from one end to the other, dipping up such crabs as may be attached to the baits; in the latter the drop-lines are longer, and are simply hauled inshore and cast out again. In suitable places crabs are caught in small seines, and many are taken in seining fish, often proving an annoyance to the fishermen from the manner in which they become entangled in the meshes of the net. Soft-shell crabs, or shedders, as those are termed which have just cast their shells, are on the U. S. Atlantic coast much more highly prized than the ordinary hard-shelled individuals, and are usually taken with dip-nets, as they will not take bait. Crabs are kept for market in floating pens or cars, and shipped in boxes packed with wet grass or seaweed, the soft-shelled crabs being packed very carefully, inclined at such an angle as to preserve the moisture in the gills. Crabs are canned and, where abundant, often used as manure. They are also largely used for bait, the shedder crabs being a favorite bait for tautog, while on the English coast the hermit crab is a favorite.

The following table shows the magnitude of the crab-fisheries of the U. S. Maryland leads in the number of crabs taken, but the catch of New York is the most valuable, while, owing to the size of the principal edible crab of the Pacific coast, the catch of California is worth almost as much as that of Maryland:

STATISTICS OF CRAB-FISHERIES FOR 1888.

DIVISIONS.	Pounds.	Value.
New England and Middle States	2,596,233	$65,226
Southern States	3,791,430	64,869
Gulf States	1,081,539	24,392
Pacific coast	231,875	37,770
Totals of hard crabs	7,701,077	$192,257
Soft crabs	2,752,909	219,614
Totals	10,453,986	$411,871

The king crab, or horseshoe crab (*Limulus polyphemus*), is of considerable local importance in the manufacture of fertilizer, and is used to a limited extent for feeding pigs and chickens, and baiting eel-pots. In the months of May and June the king crabs seek the shore to spawn, crawling out on sandy beaches in almost incredible numbers. They are usually picked up with a pitchfork or improvised spear and tossed into carts, but at some places pound-nets are used for their capture. The king-crab industry is practically confined to New Jersey, the total catch of that State, New York, and Delaware in 1888 being 3,841,000 lb., worth $8,436.

F. A. LUCAS.

Cra'bro [Lat., hornet]: a genus of hymenopterous insects; belonging to the section Aculeata, or stingbearers, and to the sub-section Fossores (burrowers). The hornet (*Crabro vulgaris*) is the type of this genus, which is now raised to the rank of a family named *Crabronidæ*. Some insects of this family excavate their nests or retreats in woods. In the U. S. they build in fences, trees, etc.

Cracow, or **Krakau**, kraa'kow: a city in Austrian Poland; on the left bank of the Vistula; 158 miles S. S. W. of Warsaw. It is connected by a railway with Vienna, Berlin, and Warsaw (see map of Russia, ref. 8–A). It is the seat of a Roman Catholic bishopric, has a castle founded about 700 A. D., a magnificent cathedral, 36 churches (formerly 76), 7 Jewish synagogues, a university (begun in 1343, chartered in 1364, finished in 1401, and reorganized in 1817), a library of 300,000 volumes, a botanic garden, and many monasteries. In 1893 the university had 126 teachers and 1,210 students. Cracow, founded about 700 A. D., was the capital of Poland from 1320 to 1609, when the court was removed to Warsaw. The Kings of Poland, however, were crowned here until 1764. On the third partition of Poland, in 1795, it was annexed to Austria. It belonged to the duchy of Warsaw from 1809 to 1812. The Congress of Vienna (1815) formed it, with a small territory, into a free state, under the protectorate of Russia, Austria, and Prussia. In 1846 it was again annexed to Austria. Pop. (1890) 76,025.

Crafts, JAMES MASON: See the Appendix.

Crafts, WILBUR FISK, B. D.: writer and lecturer; b. in Fryeburg, Me., Jan. 12, 1850; graduated at the Wesleyan University, Conn. (1869), and the School of Theology of the Boston University (1872). He served Methodist churches 1872–80; the Lee Avenue Congregational church, Brooklyn, 1880–83; the First Union Presbyterian church of New York city 1883–89; then became secretary of the American Sabbath Union, and later editor of the *Christian Statesman*,

Pittsburg, Pa. He is prominent in the National Temperance Society, the International Law and Order League, Sunday-school work, and the like. Jointly with his wife he has published *Through the Eye to the Heart* (New York, 1873); *The Coming Man is the Present Child* (Chicago, 1879); *Pocket Lesson Notes* (New York, 1886). Jointly with Prof. H. F. Fisk he published *Rhetoric Made Racy* (1884). He has also published *The Bible and the Sunday-school* (1876); *The Rescue of Child Soul* (London, 1880); *Plain Uses of the Blackboard* (New York, 1880); *Teacher's Edition of the Revised New Testament* (1881); *Talks to Boys and Girls about Jesus* (1881); *Must the Old Testament Go?* (Boston, 1883); *Successful Men of To-day* (New York, 1883); *What the Temperance Century has Made Certain* (1885); *The Sabbath for Man* (1885; revised and enlarged edition in 1892). WILLIS J. BEECHER.

Craig, JOHN: Scottish Reformer; b. in 1512. Educated at St. Andrews, he entered the Dominican order, and had charge of the novices at Bologna. Converted to the doctrines of the Reformed Church by reading a chance copy of Calvin's *Institutes*, he was tried and condemned to be burned by the Inquisition, but was saved by a mob, which, on the death of the pope in 1559, broke open the prison. He returned to Scotland 1560, and became a colleague of John Knox in the church of Edinburgh 1563. He was appointed chaplain to James VI. in 1579, and took part in the composition of the National Covenant in 1580. D. in Edinburgh, Dec. 12, 1600.

Craig, JOHN NEWTON, D. D.: secretary of Home Missions of the Presbyterian Church (South); b. in Rockingham co., Va., May 14, 1831. He was educated at Washington and Lee College, the University of Virginia, Union Theological Seminary, Virginia, and Columbia Theological Seminary, South Carolina. He has been pastor at Lancaster Courthouse, S. C., chaplain in the Confederate army, and pastor at Holly Springs, Miss. He edits the home mission paper of his church, published at Atlanta, Ga.

Craig, OSCAR JOHN: See the Appendix.

Craig, Sir THOMAS: Scottish lawyer; b. in 1538; was appointed a judge (justice depute) in 1564; knighted in 1603. He wrote, besides Latin poems, a celebrated *Treatise on Feudal Law* (*Jus Feudale*, 1608; 3d ed. 1732). D. Feb. 26, 1608.

Craig, WILLIS GREEN, D. D., LL. D.: Presbyterian theologian; b. in Lincoln co., Ky., Sept. 27, 1834, and educated at Centre College, Danville, Ky., and the Danville Theological Seminary, Kentucky. In 1862 he became pastor of the Westminster Presbyterian church of Keokuk, Ia. From 1882 he was Professor of Biblical and Ecclesiastical History in McCormick Theological Seminary, Chicago, till 1891, when he was transferred to the chair of Didactic and Polemic Theology. In 1893 he was elected moderator of the General Assembly. WILLIS J. BEECHER.

Craik, DINAH MARIA, better known as **Miss Mulock**: English novelist; b. at Stoke-upon-Trent in 1826. Her first novel, *The Ogilvies*, was published in 1849, and *John Halifax, Gentleman*, in 1857. In 1865 she married George Lillie Craik, a nephew of Prof. George Lillie Craik, the author. Besides novels and other works, she published a volume of poems. D. Oct. 12, 1887.

Craik, GEORGE LILLIE: Scottish author; b. in Fifeshire, Scotland, in 1799. In 1830 he published an interesting compilation of biographical anecdote, *The Pursuit of Knowledge under Difficulties*, in one volume. This was originally issued by the Society for the Diffusion of Useful Knowledge, but has since been many times reprinted. He wrote several of the books published by the above-named society in their well-known series, and he also rendered much valuable help in the preparation of Knight's *Pictorial History of England*, and wrote many of the historical and biographical articles in the *Penny Cyclopædia*. In 1836 appeared in the Useful Knowledge Series *Paris and its Historical Scenes*; in 1844–45 *Sketches of the History of Literature and Learning in England*. This excellent work of permanent value was rewritten from chapters on the subject in the *Pictorial History of England*. A new and enlarged edition, *Manual of English Literature and the English Language*, was published in 1862. In 1845 Craik published *Spenser and his Poetry* (3 vols.), and in 1846–47 *Bacon, his Philosophy and Writings* (3 vols.). Each of these books was reprinted in 1859–60 in one small volume. The *Bacon* is a remarkable piece of condensation, completeness, and accuracy. In 1848 appeared another book of anecdote, which has had a wide popularity, *The Romance of the Peerage*. In 1849 Craik was made Professor of History and of English Literature in Queen's College, Belfast. In 1851 he published *Outlines of the History of the English Language*, and in 1857, the first of many books of its kind, *The English of Shakespeare Illustrated by a Philological Commentary on his Julius Cæsar*. D. June 25, 1866.

Craik, ROBERT: See the Appendix.

Crajova: See KRAJOVA.

Crake (Crex): See CORN-CRAKE.

Cramer, MICHAEL JOHN, D. D.: author and minister of the Methodist Episcopal Church; b. at Schaffhausen, Switzerland, Feb. 6, 1835; graduated at Ohio Wesleyan University, Delaware, O., 1860; chaplain U. S. army 1864–67; U. S. consul at Leipzig 1867–70; U. S. minister to Denmark 1870–81; U. S. minister to Switzerland 1881–85; Professor of Systematic Theology, Boston University, 1885–87, resigning on account of ill-health. He became associate editor of the *Theological Quarterly Review* in 1889, and contributed largely to the *Methodist Review*, the *German Theological Review*, and other periodicals. After filling the chair of Church History at Drew Theological Seminary for a year, he became, in 1897, Professor of Philosophy in Dickinson College. D. at Carlisle, Pa., Jan. 25, 1898.

Cramp: a spasmodic, involuntary contraction of voluntary muscles, often painful in character. The name cramp is popularly applied especially to the form attacking swimmers, which very often leads to drowning. It may similarly result from chilling of the body, certain persons being more liable to this, as to all other forms of cramp. Localized muscular spasms not infrequently result from placing the parts, most frequently the feet, in strained positions, and in some people a spasm invariably results from some such posture. Similar localized cramps of the legs are a common and distressing symptom of cholera, and more diffused spasms may be met with in various diseases, especially in children. "Writer's cramp" is the name of the most common of the so-called "professional neuroses," conditions in which spasms affect certain groups of muscles which are used excessively in the occupation of the person. Thus in "writer's cramp" the effort to write or even take a pen in hand is sufficient to provoke a painful spasm of the muscles of the hand and forearm. Curiously the muscles may often be used in any other way excepting in that sequence or combination in which they have been overtaxed. In other words, the finely co-ordinated movements displayed in the work of the patient can not be performed without spasm. In many cases localized palsies instead of cramps are seen. Similar affections are seen in telegraphers, metal-workers, dancers, and others. TETANUS (*q. v.*) is a disease in which spasms of certain, and finally of all, muscles constitute the characteristic feature of the disease. Strychnia-poisoning may present an almost identical picture.
WILLIAM PEPPER.

Cramp, JOHN MOCKETT, D. D.: clergyman; b. at St. Peter's, Isle of Thanet, Kent, England, July 25, 1796: educated at Stepney College; ordained May 7, 1818. In 1844 he became president of the Baptist College, Montreal, Canada, and president of Acadia College, Nova Scotia, in 1851; the principal of the theological department 1853–60; was reappointed president in 1860, and retired in 1869. In 1831, in Dublin (3d ed. London, 1851), he published *A Text-book of Popery*; in 1833 *The Reformation in Europe* (issued by the Religious Tract Society, London); in 1844 *Lectures for these Times*; in 1868 *Baptist History*; in 1871 *The Lamb of God*; in 1873 *Paul and Christ: a Portraiture and an Argument*. D. in Wolfville, Nova Scotia, Dec. 6, 1881.

Cramp'ton's Gap: a pass in the South Mountains, near Burkittsville, Frederick co., Md. The left wing of Gen. McClellan's army, under command of Gen. W. B. Franklin, approached this pass about noon Sept. 14, 1862, to find it defended by a portion of the Confederate general McLaw's division of Lee's army, under command of Gen. Howell Cobb. After a stubborn fight of four or five hours the Confederates were forced out of the gap, having suffered severe loss in killed and wounded, besides losing 400 prisoners and many small-arms.

Cra'nach, or **Kranach**, krăn'ak, Germ. pron. kraa'năăkh, LUCAS; called THE ELDER: German painter and engraver; b. at Kronach, a town near Bamberg, Oct. 4, 1472. His family name is generally said to have been SUNDER. He became court-painter to Frederick, the Elector of Saxony, in 1504,

and worked for many years at Wittenberg, where he was much respected and was made burgomaster. He continued to hold the office of court-painter under the two successors of Frederick, John the Constant and John Frederick the Magnanimous, and when, after the battle of Muhlberg in 1547, John Frederick was taken prisoner, Cranach shared his five years' captivity. They were both released in 1552. He was also an intimate friend of Luther and Melanchthon, whose portraits he both painted and engraved. His works consist of oil-paintings, engravings on copper, and woodcuts. His most important picture is at Weimar. It is an altar-piece representing the crucifixion. He was so rapid and prolific a worker that he was called *pictor celeberrimus*, and it is not surprising that his pictures are found in every considerable collection in Europe. There are two good specimens of his work in the Bryan Gallery, New York Historical Society, a *Venus and Cupid* and a *Portrait*, and one in the New York Metropolitan Museum, a portrait of John Frederick the Magnanimous. D. at Wittenberg, Oct. 16, 1553. All collectors and students of prints know his numerous works, engravings on copper and especially on wood. A set of the *Passion of Christ*, a *Temptation of St. Anthony* and a *St. Jerome in the Desert*, are as well known as any. See Heller, *Das Leben und die Werke Lucas Cranach's* (2d ed. Bamberg, 1844); the latest and best authority, however, is Schuchardt, *Lucas Cranach des Aelteren Leben und Werke* (Leipzig, 3 vols., 1851–71).

Cranach, Lucas, von: portrait painter; b. in 1515; a son of the preceding; was burgomaster of Wittenberg. A good specimen of his work is in the Metropolitan Museum, New York, entitled *Portrait of a German Lady*. D. in 1586.

Cranberry [for *crane-berry*]: the fruit of several species of a sub-genus, *Oxycoccus*, of small, mostly prostrate evergreen shrubs of the natural family *Ericaceæ*, belonging to the genus *Vaccinium*, but differing from the rest of the genus in having a wheel-shaped corolla, with its four petals decidedly revolute. The species are few, natives of the colder regions of the northern hemisphere. The fruit is acid, and is in great request for making sauces, jellies, etc. *Vaccinium oxycoccus* is a native of the northern parts of Europe, Asia, and America. It grows in marshy grounds in the Northern U. S., and is a wiry, creeping shrub, with small oval leaves strongly revolute at the margin. The blossoms are small, but beautiful, and of a deep rose-color. The berries are often kept for a long time in water. They are an excellent antiscorbutic, and valuable in sea-stores. A sort of wine is made from them in Siberia and Russia. The berries of the cowberry (*Vaccinium vitis-idæa*) are sold under the name of cranberries in Scotland, and used in the same way. In Norway the fruits are esteemed. They also grow in New England and northward, where they are often collected for culinary purposes. The "high-bush cranberry" is the *Viburnum opulus* of the U. S. and Europe. Its fruit has little value, although it is sometimes eaten. The name mountain cranberry is often given to the *Arctostaphylos uva ursi* of the U. S. and Europe, a plant whose leaves are of value as a diuretic.

The cranberry of U. S. markets is *Vaccinium macrocarpum*. It is a larger plant than the European species, with larger berries and leaves with less revolute edges. It is gathered extensively from wild bogs. Early in the nineteenth century efforts were made to cultivate it, and now the annual yield from the cultivated bogs of the U. S. is about 800,000 bushels. The largest areas of cultivated cranberries occur respectively in the Cape Cod region, in New Jersey, Wisconsin, Long Island, and perhaps Michigan. Natural swamps or bogs are drained by means of open ditches, the turf is removed, and the whole area is covered 4 to 6 inches deep with sand, in which the cuttings are set at intervals of 14 or 18 inches. The bog is provided with a dam and gates at the outlet of the main ditch, so that it is possible to flood the area for winter protection, or to escape frosts, or to destroy insect or fungous injuries. For this purpose a water-head is indispensable, as a pond, lake, or diverted stream.

Cranborne, Viscount: See Salisbury, Gascoyne-Cecil.

Cranbrook, Gathorne-Hardy, Earl: English statesman; b. at Bradford, England, Oct. 1, 1814; third son of Mr. John Hardy; educated at Oriel College, Oxford; called to the bar 1840; entered the House of Commons 1856; defeated Mr. Gladstone in the contest for the seat in Parliament for Oxford 1865; Secretary of State for the Home Department 1868; Secretary of State for War in Mr. Disraeli's administration 1874; created Viscount Cranbrook 1878; succeeded Marquis of Salisbury as Secretary of State for India 1878; Lord President of the Council in Salisbury's cabinet 1885–86; created earl and baron Sept. 4, 1892.

Cranch, Christopher Pearse: artist and poet; b. at Alexandria, Va., Mar. 8, 1813; graduated at Columbian College, Washington, in 1831; studied divinity, but became a landscape-painter and author, residing in Europe from 1846–63, and subsequently at Cambridge, Mass., and in New York city. He published a volume of poems (1844), and two stories for children, *The Last of the Huggermuggers* (1856) and *Koboltozo* (1857); also a translation of Vergil's *Æneid* (1872). Many of his finest poems appeared in the *Dial*. D. Jan. 20, 1892.

Cranch, William, LL. D.: jurist; b. at Weymouth, Mass., July 17, 1769; graduated at Harvard in 1787. He was appointed chief justice of the U. S. circuit court for the District of Columbia in 1805. He held this position for fifty years, during which, it is said, only two of his decisions were overruled by the Supreme Court of the U. S. As reporter of the decisions of the Supreme Court he prepared nine volumes of reports (1801–15). His legal learning was very profound. Judge Cranch was first cousin to President John Quincy Adams. D. Sept. 1, 1855.

Crane [O. Eng. *cran*, cf. Germ. *Kranich*; related are Gr. *γέρανος*, Lat. *grus*]: any one of various birds of the order *Grallæ* or *Alectorides*, and belonging to the family *Gruidæ*, of which the genus *Grus* alone occurs in the U. S. They are nearly all large birds, with long necks, long legs, and powerful wings. Their wings are not elongated, but rounded. The cranes are often popularly confused with the herons, but structurally the two groups are quite distinct, while externally the cranes differ from the herons in having a compact plumage, toes of moderate length, hind toe short and elevated, and part of head usually bare and rough in the adult. The common European crane, *Grus cinerea*, stands about 4 feet high, is ashen gray in color, with face and neck nearly black. It breeds in marshes in northern Europe and Asia, migrating to warmer climes on the approach of winter. It formerly bred in England, but long ago it ceased to be more than an accidental visitor. Cranes migrate in large flocks, flying at a great height and like geese in a V-shaped body. The whooping crane (*Grus americana*) is larger than the common crane, which it resembles, except that its adult plumage is pure white, the wings tipped with black. It frequents the southern parts of the U. S. in winter; in summer it migrates northward. This crane is remarkable for the extent to which the windpipe is concealed in the breastbone, and for the complicated turns taken by the concealed portion. The U. S. have also the sand-hill crane (*Grus canadensis*) and the little crane (*Grus fraterculus*). To this family belongs also the demoiselle or Numidian crane (*Anthropoides virgo*), with which, rather than with the true crane, the Balearic cranes (*Balearica*) are ranked. Cranes use their bills as a weapon of defense, attacking the eyes of an assailant. The blue heron (*Ardea herodias*) is sometimes, though erroneously, called the blue crane. F. A. Lucas.

Crane: a machine employed to raise heavy weights and to deposit them at some distance from their former position. It has two kinds of motion, namely, a lifting motion and a horizontal one. The latter may be circular or along a radius or a combination of both kinds. The simplest form of crane has an upright post, moving round a vertical axis, a swinging arm jointed to the post at its lower end and fastened to the post by means of a pulley at its outer end, and a winch or other hoisting tackle.

Crane, Bruce: landscape-painter; b. in New York, 1857; pupil of A. H. Wyant, New York. First exhibited National Academy 1879. His pictures are generally painted from American motives, and are fresh in color and frankly painted. Member Society of American Artists (1881) and of American Water-color Society. Studio in New York.

Crane, Stephen: See the Appendix.

Crane, Thomas Frederick: scholar; b. in New York city, July 12, 1844; educated at the public school and academy of Ithaca, N. Y., and the College of New Jersey, Princeton (A. B., 1864; A. M., 1867; Ph. D., *causa honoris*, 1874); assistant Professor of Modern Languages, Cornell University, 1868; Professor of Spanish and Italian there in 1872; Professor of the Romance Languages 1881. Prof. Crane has devoted himself especially to the literary history of the

Romance languages during the Middle Ages, and to that branch of folk-lore relating to the diffusion of popular tales, and has published a large number of articles on these and kindred subjects in the *North American Review*, *International Review*, *Harper's Magazine*, *Lippincott's Magazine*, and *The Nation*. He was also one of the founders of the American Folk-lore Society in 1888, and has been a frequent contributor to its journal. In this line of work he has published *Italian Popular Tales* (Boston, 1885), and *The Exempla or Illustrative Stories from the Sermones Vulgares of Jacques de Vitry* (London, 1890, English Folk-lore Society). Prof. Crane has also published *Tableaux de la Révolution Française* (6th edition 1892); *Le Romantisme Français* (3d edition 1890); *La Société Française au Dix-Septième Siècle* (1889); and *Chansons Populaires de la France* (1891). C. H. Thurber.

Crane, Walter: genre and decorative painter; b. in Liverpool, 1845. Pupil of his father, Thomas Crane, portrait-painter, and of W. J. Linton. Well known as an illustrator of children's books; third-class medal for water colors, Paris Exposition, 1889. Studio in London.
W. A. C.

Crane, William H.: actor; b. in Leicester, Mass., in 1845; educated at the Boston common schools. He became a clerk in a dry-goods store in Boston, and was a member of an amateur minstrel company. He made his first appearance on the professional stage July 13, 1863, at Mechanics' Hall, Utica, N. Y., taking the part of the notary in *The Child of the Regiment*. He joined the Holman Theatrical Company, and remained with this organization for seven years, when he found an engagement with the Oates Opera Company as leading comedian. He afterward appeared in the burlesque of *Evangeline* at Niblo's Garden, New York, where he created the part of Le Blanc. He played for a season in a Chicago stock company in legitimate comedy, and then went to California, where he met with success. In 1876 he entered into partnership with Stuart Robson, the comedian, and on Jan. 29, 1877, they produced at the Park theater, New York, Leonard Grover's farce *Our Boarding House*. They subsequently appeared together in *Forbidden Fruit*, *Our Bachelors*, *Sharps and Flats*, *Comedy of Errors*, and *Merry Wives of Windsor*. Their conspicuous success in Bronson Howard's *The Henrietta* ended after two years in a dissolution of the partnership. Crane began his first starring tour alone in *The Senator* in 1889, and added much to his reputation by his artistic personation of Senator Hannibal Rivers. In 1900 he played with great success the part of *David Harum*.

Cranesbill: See Geranium.

Cra'ney Island: at the mouth of Elizabeth river in Norfolk co., Va.; has a lighthouse 50 feet high, standing in shallow water on iron screw-piles; lat. 36° 53′ 28″ N., lon. 76° 20′ W. During the civil war (1861–65) the Confederates erected batteries here.

Cranganore: a maritime town of Southern India; on the Malabar coast; about 18 miles N. of Cochin (see map of S. India, ref. 7–D). A Christian church has existed here since the fifth century at least. This place was taken from the Portuguese by the Dutch in 1663, and now belongs to the British.

Craniology: See Skull.

Cranium: See Skull.

Cranmer, Thomas: English archbishop and Reformer; b. in Aslacton, Nottinghamshire, July 2, 1489, of an ancient Norman family. He studied at Jesus College, Cambridge, of which he became a fellow, and was well versed in Greek, Hebrew, and theology. In 1523 he was appointed lecturer on theology. He gained the favor of Henry VIII. in 1529 by advising that the question of the king's divorce should be tried by the word of God and referred to the universities. He was appointed a chaplain to the king, who sent him to Rome on a special mission. He married, at Nuremburg, a niece of the reformer Osiander in 1532. He was appointed Archbishop of Canterbury in 1532 by the king, of whom he soon became the favorite minister and adviser. In 1538 he opposed the law of the *Six Articles* or the *Bloody Statutes*, which, however, was carried through by the king's influence. One of the statutes forbade marriage to the clergy. Cranmer himself was obliged to dismiss his wife. Cranmer promoted the translation and circulation of the Bible. On the death of Henry VIII., Jan. 28, 1547, Cranmer, in accordance with the royal will, was appointed one of the regents of the kingdom. He was the head of a commission which composed the Liturgy of the Anglican Church in 1548, and efficiently supported the Reformed cause during the reign of Edward VI. In 1548 he secured the legalization from Parliament of the marriage of the clergy, and then his wife returned to him from Germany. On the accession of Queen Mary, in 1553, he was placed in the tower on a charge of treason. He was also accused of heresy, and was induced by the hope of saving his life to recant, and to subscribe to the doctrines of papal supremacy and the Romish view of the real presence; but his enemies were determined not to spare his life. He was burned at the stake in Oxford, Mar. 21, 1556, and met his death with great fortitude, thrusting his right hand into the flames before his body began to burn. His works were published at Oxford, 1833, 4 vols. Recent investigations prove him to have been an eminent scholar, and possessed of a large liturgical library whence he drew the special features of the English Book of Common Prayer. See his *Life*, by H. J. Todd (1831); Dean Hook (in his lives of the archbishops); Strype's *Annals*, etc.; see also Tennyson's *Queen Mary* for a kindly view of the archbishop's character. Revised by W. S. Perry.

Crannog, krăn'ŭg, or **Crannoge**: a fortified island, such as are found in the lakes of Ireland and Scotland, and which were used as dwellings and places of refuge by the ancient Celtic inhabitants. The area of a small isle in some cases was enlarged by wooden piles or heaps of stones. Crannoges are mentioned in Irish annals as early as the ninth century. See Lake Dwellings.

Cran'tor (in Gr. Κράντωρ): Greek Academic philosopher; b. in Soli, Cilicia; lived about 300 B. C. He was a pupil of Xenocrates at Athens, and wrote, besides other works, a *Treatise on Affliction*, which was highly esteemed. He is mentioned by Horace as an eminent moralist.

Cran'worth, Robert Monsey Rolfe, Baron: an English judge; b. in Cranworth, Norfolk, Dec. 18, 1790. He was elected to Parliament as a Liberal in 1832; became Solicitor-General in 1834, and a baron of the exchequer in 1839. In 1852 he was appointed Lord Chancellor by Lord Aberdeen. Having resigned in 1858, he was again Lord Chancellor from July, 1865, to June, 1866. D. July 26, 1868.

Crape [Fr. *crêpe* < O. Fr. *cresp(e)*, curled, frizzled: Ital. *crespo* < Lat. *cris'pus*, curly]: a light, transparent fabric, made of raw silk deprived of its gloss. Crapes are crisped or smooth, according to the degree of twist in weaving. They are manufactured in Italy, England, and France, and are extensively used for mourning-dresses.

Crary, Benjamin Franklin, D. D.: minister of the M. E. Church; b. in Jennings co., Ind., Dec. 12, 1821; educated at Belmont College, Ohio; pastor and presiding elder 1845–57; president of Hamline University 1857–61; superintendent of public instruction of Minnesota 1861; chaplain in the army 1862–63; editor of *Central Christian Advocate* 1864–72; presiding elder in Colorado 1872–80; editor *California Christian Advocate* 1880. D. Mar. 16, 1895. C. H. T.

Cra'shaw, Richard: poet; b. in London about 1613; a clergyman's son. He was educated at the Charterhouse and at Cambridge; became a fellow of Peterhouse 1636. In 1644 he was ejected from his fellowship for refusing to sign the Covenant. Going to France, he became a Catholic, and, through the influence of Queen Henrietta Maria, became attendant to Cardinal Palotta, and afterward a sub-canon at Loretto, where he died in 1649. His works, marked with fertility of imagination and devout fervor, are in two parts, the sacred poems are entitled *Steps to the Temple* (London, 1646), the secular *The Delights of the Muses*; 3d ed. of the sacred poems entitled *Carmen Deo Nostro* (Paris, 1652). Fullest edition is by A. B. Grosart, privately published 1872. It was he who wrote the immortal line on the miracle at Cana, *Lympha pudica deum vidit et erubuit* (the modest water saw its God and blushed).

Cras'sus, Marcus Licinius: a Roman triumvir; b. about 108 B. C.; in his youth a partisan of Sulla. He was elected prætor in 71 B. C., and defeated Spartacus, the leader of a servile revolt. In the year 70 he was chosen consul as the colleague of Pompey. He amassed an immense fortune by speculation, mining, dealing in slaves, and other methods. Avarice is said to have been his ruling passion, but for the sake of political success he gave large gifts to the people. About 60 B. C. he united with Cæsar and Pompey in a coalition called the first triumvirate. Crassus and Pompey hav-

ing been chosen consuls in 56 B. C., the former obtained command of Syria for five years. He invaded Parthia in the year 54, in order to enrich himself by plunder. In 53 B. C. he was defeated with great loss by the Parthian general Surena, near Carrhæ (the Haran of the Bible). He was treacherously killed at a conference with Surena soon after that battle (53 B. C.). See Plutarch, *Life of Crassus*.

Cratæ'gus [Gr. κραταιγός, a thorn-bush]: a genus of trees and shrubs of the family *Rosaceæ*, nearly related to the apple and pear. About sixty-five species have been described, but it is the opinion of botanists that many of these are synonyms. They are almost entirely confined to the northern hemisphere of both continents, and are most numerous in North America. They are characterized by their spiny branches, adnate calyx-tube which surrounds and grows over the carpels, two-ovuled carpels which become bony at maturity, persistent calyx-lobes, and deciduous leaves. The flowers resemble those of the apple, but they are usually white, and are often ill-scented. The best-known species is the hawthorn, *C. oxyacantha*, a small tree, native of Europe and portions of Asia. It is abundant in Great Britain, and is often planted in the U. S. It bears small, dark-green three- to five-lobed leaves, sweet-scented white or pink flowers, and small, globular or ovoid, red fruits. It is extensively grown for hedges, for which it is admirably adapted, its sharp thorns forming an effectual barrier to any passage. By long cultivation it has given rise to twenty or more well-marked varieties, varying from apetalous forms to those with a multitude of petals, and from white to pink, rose, and orange flowers, with leaves from almost entire to laciniate, and from green to golden margined. The fourteen North American species are: *C. douglasii* of the Pacific coast; *C. brachyacantha* of Louisiana and Texas; *C. crus-galli*, *C. coccinea*, *C. mollis*, *C. tomentosa*, and *C. punctata*, generally from the Rocky Mountains eastward; *C. spathulata*, *C. flava*, *C. cordata*, *C. viridis*, *C. apiifolia*, *C. uniflora*, and *C. æstivalis* of the Southern U. S. C. E. B.

Crater: See VOLCANOES.

Crater Lake: in the western part of Klamath co., Ore. It is oval in form, with diameters of 6 miles and 5 miles, and is 2,000 feet deep. Its surface lies at an altitude of 6,240 feet. From its margin on every side rise cliffs, the peaks of which are from 1,500 to 2,000 feet above the water. From the crest line of the cliffs there is everywhere a descent away from the lake, so that its catchment basin is little larger than its surface. It is fed by springs and has no visible outlet. As its name implies, it occupies the crater of an extinct volcano, and this volcano was at one time several thousand feet taller than the surviving cliffs, having probably lost its apex through the refusion of the underlying core and the consequent falling in of the higher parts. The rock is andesitic, but a cone of basalt stands within the crater near its western side, projecting from the lake as an island. G. K. G.

Crat'erus (in Gr. Κρατερός): Macedonian general; one of the successors of Alexander the Great. He served under that prince in Asia, and was one of his favorite generals. After the death of Alexander (323 B. C.) he was associated with Antipater in the government of Macedonia. He was defeated by Eumenes, and killed in battle in Cappadocia in 321 B. C.

Cra'tes of Athens: Greek comic poet; flourished about 450 B. C. He was also an actor, and performed parts in the plays of Cratinus. According to Aristotle, Crates is memorable for having widened comedy from a personal satire to a universal work of art. Only small fragments of his comedies are extant, in Meineke's and Kock's collections.

Crates of Mallus in Cilicia: Greek grammarian of the second century B. C.: founder of the Pergamene school; commentator on Homer and determined opponent of Aristarchus. Sent by Attalus, about 167 B. C., to Rome as an ambassador, he broke his leg, and, being thus detained, delivered the first lectures on grammar ever delivered in Rome. See C. Wachsmuth, *De Cratete Mallota* (1860). B. L. G.

Crates of Thebes: Cynic philosopher who lived about 320 B. C., and was a disciple of Diogenes at Athens. He had a high reputation for probity, wisdom, and self-control. He was rich in his youth, but set an example of voluntary poverty. He wrote poems and other works, which are all lost.

Crati'nus (in Gr. Κρατῖνος): one of the leaders of the old Attic comedy; b. in 519. The Archilochus of comedy, he wielded personal satire and invective without reserve, and attacked Pericles unmercifully. In the *Knights* (424) Aristophanes undertook to pity him. His reply the next year was a brilliant victory over the *Clouds* with his *Wine-flask*, in which he represented Comedy as his lawful wife and the wine-flask as the charmer who had won him from his allegiance. It was he who opened the field of mythological travesty. D. 422 B. C., though a later date has been advocated. Fragments in Meineke's and Kock's collections.

Cratip'pus (in Gr. Κράτιππος): a Greek Peripatetic philosopher; b. in Mytilene about 75 B. C. He was the most eminent philosopher of that age in the estimation of Cicero, who was his pupil and friend. Pompey, after his defeat at Pharsalia, had an interview with Cratippus, who conversed with him on the justice of Providence. Brutus attended his lectures at Athens in 44 B. C. The only work attributed to him is one entitled *On Divination by Dreams*.

Crato: a city in the southern part of the state of Ceará, Brazil; near the borders of Piauhy and Pernambuco, and 325 miles from the coast at Fortaleza (see map of South America, ref. 4–H). It is in a fertile valley, watered by the little river Grangeiro, one of the few perennial streams of Ceará. During the dry season, when most of the neighboring tableland is like a desert, the valley of the Grangeiro remains green and affords good pasturage; it thus serves as a refuge for the herds, and has become a principal center of the grazing industry. Crato appears to have been settled by explorers from Pernambuco, about 1610. Since 1820 it has been the scene of frequent political disorders. Pop. about 10,000. HERBERT H. SMITH.

Craven, EARLS OF (1801): Viscounts Uffington, Barons Craven (England, 1665).—GEORGE GRIMSTON CRAVEN, third earl, b. Mar. 16, 1841; succeeded his father, WILLIAM CRAVEN (b. July 18, 1809) Aug. 25, 1866. D. Dec. 7, 1883, and was succeeded by WILLIAM GEORGE ROBERT, b. Dec. 16, 1868.

Craven, ALFRED WINGATE: civil engineer; b. in Washington, D. C., Oct 20, 1810; graduated with honors at Columbia College, New York, and studied engineering, rapidly rising to the first rank in his profession; in 1849 became prominently connected with the Croton aqueduct, New York; shortly after its completion was appointed engineer-in-chief to take charge of it; was afterward chosen commissioner in connection with the aqueduct, and subsequently filled both positions, engineer-in-chief and commissioner, and took complete charge of all the public works. He planned and carried into operation the system of sewerage which is now in use in New York city. He was one of the projectors and the first president of the American Society of Civil Engineers. D. in Chiswick, England, Mar. 29, 1879.

Craven, ELIJAH RICHARDSON, D. D., LL. D.: secretary of the Presbyterian Board of Publication and Sunday-school Work; b. in Washington, D. C., Mar. 28, 1824; graduated at Princeton College 1842, and Princeton Theological Seminary in 1848. Before entering upon his present work he was pastor of the Reformed (Dutch) church of Somerville, N. J., 1850–54, and of the Third Presbyterian church of Newark 1854–1887. He was moderator of the General Assembly in 1885. Besides many articles published, he edited the American edition of the volume on *Revelation* in the Lange Series 1874. WILLIS J. BEECHER.

Craven, THOMAS T.: naval officer; b. in Portsmouth, N. H., Dec. 30, 1808; entered the navy as a midshipman May 1, 1822. During the summer of 1861 he commanded the Potomac flotilla. He served with distinction in the civil war 1861–65. In 1862 he was made commodore; in 1866 rear-admiral; in 1866–68 commanded navy-yard at Mare island, Cal.; in 1869 retired. D. in Boston, Mass., Aug 23, 1887.

Craven, TUNIS A. M.: See the Appendix.

Crawfish, or **Crayfish**: several long-tailed decapodous crustaceans, those of Europe and the Pacific States of the American Union belonging to the genus *Astacus*, while those of the Eastern States and the Mississippi valley belong to the genus *Cambarus*. They inhabit fresh water, and dig long burrows in the earth. They feed upon insects, mollusks, dead animals, etc. By some they are esteemed for the table. Crawfishes do immense damage by opening passages for water through the levees of the Mississippi, which in some cases have caused extensive crevasses. In New England they are quite rare. Certain salt-water crustaceans

are popularly called crawfishes, especially the spiny lobsters, of the genus *Palinurus*.

Crawford, Earls of (1398): Earls of Balcarres (1650); Barons Lindsay (previous to 1443); Barons Lindsay of Balcarres (1633); Lords Lindsay and Barneil (Scotland, 1650); Barons Wigan (United Kingdom, 1826).—Alexander William Crawford Lindsay, twenty-fifth earl, M. A.; b. Oct. 16, 1812; author of *Letters on Christian Art*, *Lives of the Lindsays*, *Progression by Antagonism*, etc.; succeeded his father, James (b. Apr. 24, 1783), Dec. 15, 1869. D. Dec. 13, 1880, and was succeeded by James Ludovic Lindsay (b. July 28, 1847) as twenty-sixth earl.

Crawford, Francis Marion: American novelist; son of Thomas Crawford, the sculptor. He was born at the baths of Lucca, Italy, Aug. 2, 1854; studied at Cambridge (England), Heidelberg, and Harvard Universities; and traveled in India, where he edited a newspaper at Allahabad. This experience furnished the material for his first fiction, *Mr. Isaacs* (1882). He has written many other novels, including *Saracinesca* (1887); *Pietro Ghisleri* (1893); *Katherine Lauderdale* (1894); *Casa Braccio* (1895); *Taquisara* (1896); *Corleone* (1897); *Via Crucis* (1899); *In the Palace of the King* (1900).

Crawford, George Washington: lawyer; b. in Columbia co., Ga., Dec. 22, 1798; graduated at Princeton in 1820; admitted to practice law in Georgia in 1822; attorney-general of Georgia 1827–31; a member of Congress in 1843; Governor of Georgia 1843–47; and Secretary of War under President Taylor 1849–50. D. July 22, 1872.

Crawford, Martin Jenkins: lawyer; b. in Jasper co., Ga., Mar. 17, 1820; educated at Mercer University; rose to distinction at the bar; elected to the State Legislature 1845; elevated to the bench in 1853; in the House of Representatives 1856–61; withdrew on the secession of Georgia; a member of the Congress of the Southern States which met at Montgomery Feb. 4, 1861; one of the three commissioners appointed by that body to treat with the authorities at Washington for a peaceful separation of the States; after the war resumed the practice of his profession; at the time of his death, July 22, 1883, was associate justice of the Supreme Court of Georgia.

Crawford, Samuel Wylie: U. S. military officer; b. in Franklin co., Pa., Nov. 8, 1829; graduated at the University of Pennsylvania 1847; appointed assistant surgeon U. S. army 1851; served in Texas and New Mexico and through the civil war, becoming brevet major-general. At Antietam, in 1862, he took command of Mansfield's division after the latter's death, and was severely wounded. Retired on account of wounds Feb. 19, 1873. D. in Philadelphia, Nov. 3, 1892.

Crawford, Thomas: sculptor; b. in New York, of Irish parentage, Mar. 22, 1814; studied under Frazer and Launitz, workers in marble, in New York; went to Italy in 1834 and was a pupil of Thorwaldsen at Rome, where he worked for many years. He was employed in 1849 by the State of Virginia to execute a colossal equestrian statue of Washington, which is at Richmond. Among his works are a statue of *Orpheus* and a colossal statue of the Genius of America, which is on the dome of the Capitol at Washington. D. in London, Oct. 16, 1857.

Crawford, William Harris: U. S. statesman; b. in Amherst co., Va., Feb. 24, 1772; removed to Georgia in his early youth; admitted to the bar 1798; settled at Lexington, Ga.; elected U. S. Senator 1807 by the Democrats; minister to France in 1813; Secretary of War in 1815; Secretary of the Treasury 1816–25. In 1824 he was nominated for the presidency of the U. S. by a Congressional caucus, and received forty-one electoral votes, the other candidates being Andrew Jackson, John Quincy Adams, and Henry Clay. (See Caucus.) D. Sept. 15, 1834.

Crawfordsville: city and railway center; capital of Montgomery co., Ind. (for location of county, see map of Indiana, ref. 6–C). It is the seat of Wabash College, founded 1832, and has fine public schools; its leading industries are manufactures of buggies, nails, spokes, hubs, barbed wire, and coffins; it also has 3 foundries, 3 planing-mills, 4 elevators, 2 flour-mills, electric light, water-works, gas, natural and artificial. Pop. (1880) 5,251; (1890) 6,089; (1900) 6,649.
Editor of "Argus News."

Crayer, krăă'i-ay', Gaspar, de: Flemish painter; imitator of Rubens and of Van Dyck, with whose works Crayer's are sometimes confounded; b. at Antwerp in 1582, and to be studied to the greatest advantage in the museums of Ghent, where are in the museum a *Judgment of Solomon*, and in the church of St. Michael a fine *St. Catherine*, and his native city, especially a picture of *Elijah in the Desert*. D. 1669. W. J. S.

Crayfish: See Crawfish.

Crayon [Fr. deriv. of *craie*, chalk: Ital. *creta* < Lat. *cre'ta*, chalk; so named from island of Crete; cf. Germ. *Kreide*]: a pencil used for drawing and made of chalk or a hardened paste of any finely powdered material, so as to make black, colored, or even white marks on paper or other surface; but not including ordinary lead-pencils, nor, in general, the slips of charred willow-wood used for charcoal drawings.

Creameries: See Butter.

Cream of Tartar (*acid potassium tartrate*, *bitartrate of potash*), or **Potassæ Bitartras** [pharm.]: a compound contained in grape-juice and deposited from it in the process of fermentation, as it is less soluble in alcohol than in water. The crystalline crusts deposited are called *crude tartar*, or *argol*. When this crude tartar is purified it yields *cream of tartar*, which is the acid tartrate of potassium, $KH_5C_4O_6$. This salt is difficultly soluble in water, and insoluble in strong alcohol.

It is frequently adulterated with sawdust, clay, gypsum, flour, chalk, alum, and sulphate of potash. Samples purchased from several grocers in New York were found to contain considerable proportions of gypsum, or sulphate of lime, in one case 70 per cent. Cream of tartar is extensively used, in connection with bicarbonate of soda, as a substitute for yeast and leaven for raising bread. (See Bread.) Cream of tartar is often used as a mordant in dyeing wool. In medicine it is used for its cathartic, diuretic, and refrigerant properties. It is frequently prescribed in combination with senna, sulphur, or jalap. It is also used for the preparation of soluble tartar (neutral tartrate of potash), Rochelle or Seignette salts (tartrate of potash and soda), tartar emetic (tartrate of potash and antimony), tartarized iron (tartrate of potash and iron), white and black flux, etc. Salt of tartar is the carbonate of potassa, prepared by the incineration of cream of tartar. Revised by Ira Remsen.

Crease: See Cricket (the game).

Creasote: See Creosote.

Crea'sy, Sir Edward Shepherd: English historian and lawyer; b. in Bexley, Kent, in 1812; educated on the foundation at Eton, where he obtained the Newcastle scholarship in 1831; elected scholar of King's College, Cambridge, in 1832, and fellow of the same college in 1834; called to the bar at Lincoln's Inn in 1837; became Professor of History in University College, London, in 1840; and was appointed chief justice of Ceylon in 1860. Among his works were *Fifteen Decisive Battles of the World* (1851) and a *History of England* (1869–70). D. Jan. 27, 1878.

Cre'atine [from Gr. κρέας, flesh]: a compound discovered in 1835 by Chevreul in raw muscular flesh, and afterward carefully studied by Liebig and others. Anhydrous creatine has the formula $C_4H_9N_3O_2$. Creatine is found in the flesh of many if not all vertebrate animals, but is now generally considered to be one of the products of the normal destruction of the tissues. It occurs in the urine.

Creat'inine: a powerful organic base or alkaloid ($C_4H_7N_3O$); existing in small quantities in the juice of animal flesh and in urine as one of the products of the physiological destruction of tissues. When creatine is subjected to the action of strong acids it is changed to creatinine, which crystallizes in colorless prisms.

Crébillon, krā'beĕ'yōn', Prosper Jolyot, de: French dramatic poet; b. at Dijon, Jan. 13, 1674. He produced in 1705 *Idoménée*; in 1707, *Atrée*; in 1709, *Électre*; *Rhadamiste et Zénobie* in 1711; and *Pyrrhus* in 1726, after which he wrote nothing for twenty years. He was admitted into the French Academy in 1731. His genius was hampered by poverty. Among his later works is *Catilina* (1749). He is ranked among French dramatists of the first order. D. June 17, 1762. (See D'Alembert, *Éloge de Crébillon*.)—His son, Claude Prosper Jolyot de Crébillon, *fils*, romancist (1707–77), is known as one of the most libertine writers of a most dissolute age.

Crécy, krā'see': small town of France; department of Somme; about 12 miles N. of Abbeville (see map of France, ref. 2–E). It was the scene of a signal victory gained by Edward III. with 40,000 English soldiers over a French

army of 100,000 on Aug. 26, 1346. It is stated that nearly 30,000 of the French were killed in this action. Pop. (1896) 1,592.

Credentials [from Late Lat. *credentia*, credence, deriv. of *cre'dere*, believe]: papers or letters given to an ambassador or other diplomatic agent, in order to enable him to claim the confidence of the court to which he is sent. There are two sorts of credentials—the one sealed, drawn up and countersigned by the Minister of Foreign Affairs; the other open, and signed only by the king.

Credi, Lorenzo, di: Florentine painter: b. 1459; pupil of Verocchio and fellow-pupil of Leonardo, and one of the most fertile and highly reputed of the school to which he belonged. His sacred subjects are characterized by qualities of noble expression and severe drawing, and his portraits are of admirable fidelity and character. D. Jan. 12, 1537. An important picture is the altar-piece in the cathedral of Pistoia, and there is a fine *Nativity* in the academy at Florence, besides easel pictures in most of the museums of Europe. W. J. Stillman.

Credit [Fr. *crédit*: Ital. *credito* < Lat. *cre'ditum*, loan, what is intrusted, ptc. of *cre'dere*, trust]: in bookkeeping, abbreviated as *Cr.*, the reverse of *debit*, denoting in personal accounts those items or values received from the party named at the head of the account. The term credit or creditor is also applied to the side of an account-book on which are entered all moneys, goods, etc., received by the party that keeps the book. In political economy, credit means the power of borrowing money on other property, whether by nation or by individuals. In a majority of cases loans are made by persons who wish to retire from business, or who have more capital than they can advantageously employ, to parties entering into business or who wish to increase their business. "Public credit" means the general confidence placed in the solvency of a state, and in its fidelity as well as its ability to pay its debts, or at least the interest on the same. Revised by A. T. Hadley.

Crédit Agricole: See Commercial Crises.

Crédit Foncier, krā'dĕĕ' fōn'sĕĕ-ā' [i. e. landed credit, from *fond*, bottom or ground]: in France, a plan of borrowing money by mortgaging land (for a sum not exceeding half its value), and repaying the borrowed money and interest in small and regular installments. The Crédit Foncier was established Feb. 28, 1852. See Commercial Crises.

Credit, Letters of: See Letters of Credit.

Crédit Mobilier, krā'dĕĕ' mō'bĕĕ'lĕĕ-ā' (i. e. credit on movable or personal property): a gigantic scheme or joint-stock company which originated in France in 1852, and was sanctioned by the Government, with a capital of 60,000,000 francs. The objects of it are: 1. To initiate trading enterprises of all kinds on the principle of limited liability; 2. To supersede or buy up trading companies—e. g. railway companies—and to substitute scrip and shares of its own for the shares and bonds of the company; and 3. To carry on the business of a bank or bankers on the principle of limited liability. See Aycard, *Histoire de Crédit Mobilier* (1867).

The Credit Mobilier of America is the title of an organization chartered in Pennsylvania in 1859 as a corporation for a general loan and contract business, and reorganized in 1864 with the intention, it would appear, of enabling the shareholders of the Union Pacific Railway and others associated with them to reap enormous profits in case of success. The honesty of its management having been impeached, the affairs of the Credit Mobilier received (1872–73) an investigation from Congress, certain members of which were charged with having unlawfully profited by the enterprise. There has been no institution of this kind in Great Britain. Revised by A. T. Hadley.

Creed [from Lat. *crē'do*, I believe, the first word in the Latin versions of the creeds of the Church]: a term originally signifying "belief," but commonly applied to a statement or profession of fundamental points of belief (Lat. *symbolum*: Fr. *symbole* or *profession de foi*; Germ. *Glaubensbekentniss*), especially applied to summaries of Christian doctrine. The Protestant Churches agree in considering creeds mere standards of belief, the Bible alone affording authoritative rules of faith and practice, but they differ in their estimate of the importance of symbols. Among the more important creeds are the following:

The Apostles' Creed, a summary of the Christian faith which most Christian Churches accept. Many ancient writers assert that this was composed by the apostles themselves, before they separated after our Lord's ascension; but this tradition is now almost universally rejected. The substance of it is no doubt very ancient, but in its present form it dates from the fourth century.

The Athanasian Creed, once supposed to be the work of Athanasius, was certainly composed by some other hand. It probably originated in Gaul, not far from the middle of the fifth century, but its author is not known. It is now omitted from the services of the Protestant Episcopal Church in America, but it is still read in the Church of England.

The Niceno-Constantinopolitan (or Nicene) Creed was first adopted at the Council of Nice 325 A. D. This creed sets forth the faith of the Church in respect to the errors of Arianism. It is admitted by many Protestant Churches, and is held as authority in the Roman and Greek Churches. The form in which the Nicene Creed now appears in the Anglican prayer-books is essentially identical with the modified form of this creed adopted by the second œcumenical council of Constantinople, 381 A. D., with the addition of "and of the Son," made at Toledo in 589. The above formulas are known as the three catholic or general creeds, because they are received by the Greek and Roman Churches, as well as by several Protestant bodies.

The Creed of Chalcedon was an exposition of faith declared by the fourth œcumenical council, held A. D. 451 at Chalcedon. It embraced the Niceno-Constantinopolitan Creed, followed by a statement of the doctrine of Christ's Person.

The so-called Creed of Pope Pius IV. is a statement of the doctrines of the Roman Catholic Church, as established by the Council of Trent. It was issued in 1564 by Pius IV. as a bull. It is slightly altered from the Nicene Creed in the first part, but is much more complicated, and especially enforces the doctrine of transubstantiation. It is sometimes called the *Tridentine Profession*.

The Greek Church has no symbolical books, strictly speaking, but approves the *Answers of the Patriarch Jeremiah to the Lutherans* (1576–80), the *Orthodox Confession of Peter Mogila* (1643), and the *Eighteen Articles of the Synod of Bethlehem* (or Jerusalem) (1672).

The Russian Church, in addition to its use of the above-mentioned documents, has of its own: (1) the *Primer for Children* (1720); (2, 3) the *Shorter* and *Longer Catechisms* (1839); (4) the *Treatise on the Duty of Parish Priests* (1776).

The Lutheran Church has had many creeds and confessions. Besides the Apostles', Nicene, and Athanasian Creeds, may be mentioned the Augsburg Confession (1530), the Articles of Schmalcald (1537), the Catechisms of Luther (1529), the Confession of Lower Saxony (1571), the Suabian-Saxon Formula (1575), the Torgau Formula (1576), and the *Formula Concordiæ* (1577).

The Calvinistic Confessions of Basel (1534), the Tetrapolitan Confession (1530), those of the Helvetic churches (1536–66), the Heidelberg Catechism (1563), the *Expositio Simplex* (1566), the *Formula Consensus* (1675), the Gallican Confession (1559), the Belgic Confession (1559–61), the Scottish Confession of 1560, and especially the great Westminster Confession (1646), and Catechisms (Shorter, 1647; Larger, 1648), the standards of the Presbyterian churches, are among the most important Protestant symbols. The articles held by the Congregationalists and Baptists are based upon the Westminster Confession.

The Church of England receives the three catholic creeds and the *Thirty-nine Articles*, which, however, are not regarded in the light of a "creed" by either the Church of England or the Protestant Episcopal Church in the U. S., which receives a modification of them. (See the article Thirty-nine Articles.) The *Articles* of the Methodist Episcopal Church are also based upon the *Thirty-nine Articles* of the Anglican Church. The best book on the general subject is by Philip Schaff, *Creeds of Christendom* (New York, 6th ed. 1890, 3 vols.; history, with texts, of the Confessions). Revised by S. M. Jackson.

Creede: mining-town; capital of Mineral co., Col. (for location, see map of Colorado, ref. 5–C); situated in a narrow ravine on Willow creek, a small tributary of the Rio Grande; 320 miles by rail S. W. of Denver; the terminus of a branch railway, 10 miles long, connecting with the Denver and Rio Grande R. R. at Wagon Wheel Gap. It has very rich silver mines, extensive lumber-yards, electric lights, etc. The town is of recent growth, increasing from a small cluster of cabins

in 1891 to a town of over 5,000 inhabitants (including environs) in 1893. It is named from N. C. Creede (b. at Fort Wayne, Ind., in 1843), who staked out the first mine there in 1889. The business part of the town was almost entirely destroyed by fire June 5, 1892, the loss aggregating $1,000,000. Pop. (1900) 938.

Creed'moor: village; Queens co., N. Y. (for location of county, see map of New York, ref. 8–K); on Long Island and on railway; 13½ miles E. of New York city; has the largest and most complete rifle-range in the U. S., belonging to the National Rifle Association, and is much frequented for target-practice. The range was established in 1871, chiefly at the expense of the State and the cities of New York and Brooklyn. It now belongs to the State of New York.

Creeks: See MUSKHOGEAN INDIANS.

Creeper [named from the movements of the bird]: a popular name for several passerine birds of the genus *Certhia* and other allied genera of the family *Certhiidæ*. The com-

Creeper.

mon creeper of North America, *Certhia familiaris americana*, may be at once recognized among little perchers by its slender, curved bill and rigid tail, much like that of a woodpecker. It is quick and restless in its movements, and scrambles about the trunks of trees, searching among the crevices of the bark for insects and their eggs. Unlike the nuthatches, it never hangs head downward. F. A. LUCAS.

Creeping of Rails: the remarkable phenomena of the motion of the rails of a railway-track in the direction of the traffic, which occurs on elastic road-beds, on grades, and particularly on bridges. For instance, on the western division of the Canadian Pacific Railway the line crosses a bog which yields about 6 inches under a train, so that the track is thrown into a series of waves. Under an ordinary train the rails creep a distance of about 12 inches in a length of 1¼ miles, and with a heavy consolidation engine, hauling thirty-five cars, the amount of creeping is 20 inches. On the eastern approach of the St. Louis bridge and on the bridge itself, a distance of 4,100 feet, the amount of creeping averaged, before 1885, about a foot per day, so that men were constantly employed in putting in short pieces of rails at one end and taking them out at the other. Spikes, bolts, and the strongest kind of joints have proved ineffectual in preventing creeping, these either being broken under the powerful stresses or the rails themselves twisted out of place.

The reason for the creeping of rails was not understood until 1885, when the subject was investigated by Prof. J. B. Johnson, of Washington University, St. Louis, who also pointed out an effectual remedy. The cause is the wave-motion of the rail, and the consequent elongation of the lower flange, under the passage of the traffic. The rear end of a line of rails being held down by the weight of a car or a train, the front end of the lower flange moves slightly forward by virtue of that elongation, and the train in passing on holds it firmly down in turn in the new position. The remedy is to support the rail under the head instead of under the lower flange, and when this can be done the tendency is to creep backward. See *Journal of the Association of Engineering Societies* (Nov., 1884). MANSFIELD MERRIMAN.

Crees: See ALGONQUIAN INDIANS.

Crefeld, krā'felt: a manufacturing town of Rhenish Prussia; 13 miles N. W. of Düsseldorf, on the railway to Cologne (see map of German Empire, ref. 4–C). It is well built, and has more extensive manufactures of silk than any other town in Prussia. Here are also manufactures of cotton, linen, and woolen fabrics, lace, earthenware, etc. Pop. (1880) 73,872; (1895) 107,245.

Creighton, JAMES EDWARD: See the Appendix.

Creighton, MANDELL, LL. D.: Bishop of London; b. at Carlisle, 1843; educated at Durham Grammar School and at Oxford; ordained deacon 1870; priest 1873; after holding various preferments he became, in 1885, canon of Worcester Cathedral; in 1884 he was elected Professor of Ecclesiastical History in Cambridge; appointed Bishop of Peterborough 1891, and Bishop of London 1896. Author of a *History of the Papacy during the Period of the Reformation* (1882–87; his most important work); *Primer of Roman History* (1875); *The Age of Elizabeth* (1876); *The Life of Simon De Montford* (1877); *Primer of English History* (1877); *Cardinal Wolsey* (1888); *Carlisle* (1889). Editor of the *English Historical Review* from Jan., 1886. He represented Emmanuel College at the 250th anniversary of Harvard College in 1886, when he received the degree of LL. D. D. Jan. 14, 1901.

Cremation [from Lat. *crema'tio*, deriv. of *crema're*, to burn]: the act or custom of burning the dead, especially as a substitute for earth-burial. The custom, which is one of great antiquity, prevailed in Eastern Asia and Western Europe, and was observed by not a few North and South American Indian tribes. The few instances of cremation given in the Old Testament narratives seem to indicate that the Jews resorted to it rarely. The Phrygians are believed to have introduced the practice into Greece, where, as the poems of Homer show, it was common at the time of the Trojan war, although it did not supplant earth-burial; and the Romans borrowed it from the Greeks, or perhaps from the Etruscans. Among the Romans it was generally practiced during the last years of the republic and under the empire, but was abandoned toward the end of the fourth century A. D. It was at one time the favorite method of disposing of the bodies of the dead among the Chinese, and Marco Polo, who traveled in China toward the end of the thirteenth century, found a crematory in every town he visited; but the custom is no longer observed in that country, although universal in Japan, into which it was introduced by the Buddhists. Cæsar relates that the Gauls burned their dead, and the relics and urns found in burial-mounds of Germany, Denmark, Scandinavia, and Great Britain, testify to the prevalence of cremation in Northern Europe in the "bronze age," if not at a later period. The ancient practice was to burn the dead upon a funeral pyre of wood, upon which oil, incense, and spices, and sometimes food and clothing, were placed (a practice similar to that prevalent among savages of burying food and weapons with the dead, and of sacrificing horses, dogs, or even slaves, for the service of the departed). Finally, the embers were quenched with wine, and the ashes, placed in a CINERARY URN (*q. v.*), were deposited in a sepulcher (*columbarium*) or subterranean cell, or in some cases buried in the earth at the spot where the cremation took place. Cremation was unknown among the early Christians, chiefly because those who had come out of Judaism had inherited the custom of entombing the dead, and that method was hallowed by the burial of their Lord; with the spread of Christianity, the custom was perpetuated, and cremation came to be looked upon with abhorrence, largely because it seemed inconsistent with a belief in the resurrection of the dead. The burning of the body of the poet Shelley and that of his friend Edward Williams, in 1822, and one which occurred in South Carolina earlier in the nineteenth century, are among the few instances of the occurrence of cremation in Christian lands before the year 1869.

At the present day, in India and other Eastern countries, as well as in Japan, the dead are usually burned, and in India, until 1847, it was a common practice for a wife to burn herself in a funeral pile along with the body of her husband. (See SUTTEE.) Some native tribes of Northwestern British America still dispose of dead bodies by cremation. During the French Revolution it was proposed to reintroduce the practice of cremation, but no decided steps were taken. In 1856 Prof. H. C. Richter contributed an article to the *Gartenlaube* of Leipzig, in which a crematory furnace was described. The subject was discussed by scientists in Italy in 1866; in 1869 Prof. Brunetti, of Padua, cremated the body of a woman; and in 1873, at the Vienna Exposition, he exhibited a model

furnace, together with some results of his experiments. In 1874, when a closed receptacle was used for the first time, the body of a woman was cremated at Breslau and another at Dresden. One of these was the wife of Sir Charles Dilke. In 1874, largely through the efforts of Sir Henry Thompson, a society for the promotion of cremation was formed in London, and in 1878 a crematory was built at Woking, in Surrey; but the first cremation in England did not take place until 1882, and even then was performed privately. In 1884 the act was declared legal in Great Britain, under certain conditions. In June, 1876, a congress of societies for the promotion of cremation met in Dresden, and the published reports of their proceedings did much to remove popular prejudice. In 1876, also, Dr. Francis J. Le Moyne erected a crematory near Washington, Pa., and in December the body of Baron de Palm, who had died in New York, was burned. In that same year a body, that of Henry Berry, of Marion, S. C., was burned on a funeral pile. Cremation is now very general in Italy, where it was legalized in 1877. Paris, Gotha, and other continental cities have crematories, and societies advocating the measure exist in countries where it is still prohibited. In some places, as at Gotha, columbaria are attached to the crematory temple. In the U. S. crematories have been built in a number of places, including Washington, Lancaster, Philadelphia, Pa., Fresh Pond, L. I., Buffalo, N. Y., Detroit, Mich., St. Louis, Mo., Los Angeles, Cal., and Davenport, Ia.

There are two distinct classes of arguments—hygienic and sentimental—in favor of cremation. The sanitarian urges the danger to the living of placing beneath the surface of the earth great numbers of the dead near large cities, gradually to decompose, thus contaminating the water and poisoning the air by the liberated gases, the overloaded soil being able to do its work of disinfection only to a limited extent. The fear of being buried alive is very general, and is a powerful cause acting in favor of cremation. It simplifies very much the funeral rite, and hence from its economy commends itself to a large class. The objections to cremation, on religious grounds, are met by those who favor it with the statement that it makes the words of commitment, "ashes to ashes, dust to dust," literally true, and that to deny the possibility of resurrection in such case is to deny the omnipotence of the Creator. Furthermore, it permits the use of the same religious ceremonies as before; and generally a chapel for services is attached to a crematory. The most important objection raised against such total and rapid destruction of the body is medico-legal, as it is claimed that evidences of poisoning and violence would be destroyed. This is met by the statement that necessarily there would be a more careful examination of bodies before burning, and probably a more general detection of crime. In all cases, the most decided measures are taken to prevent any irregular use of the process.

Cremation Furnaces.—The Siemens cremation furnace, which is used in Germany, consists of, first, a furnace, in which the body is placed for cremation; and, secondly, a regenerator, in which the gas and air used for combustion are heated before entering the cremation-chamber. The gas for combustion is prepared at a distance from the furnace, and led to it through underground flues. For general description of these furnaces, see FURNACE (Siemens iron). The regenerators consist of fire-brick chambers filled with fire-brick laid loosely, having regular spaces between them through which the air and gas can pass. The gas and air are admitted at the bottom of the regenerators through separate valves, and pass upward through the loosely laid fire-brick, to become heated by contact with them—in what way will be shown presently. The heated gas and air unite at the entrance to the cremation-chamber, where combustion ensues, producing an intense heat and flame that reach to the door at the farther end of the furnace. The burnt gases, after circulating through the furnace, pass back again to the end of the furnace at which they entered—the entrance and exit passages being separated vertically by a thin diaphragm of fire-brick—and downward through the regenerators, heating the loosely laid fire-brick in their descent, and passing out at the bottom of the regenerators, comparatively cold, through the valves to a high chimney-stack, whence they escape into the air. At stated intervals the butterflies in the valves are reversed, by which the currents of air and gas are changed, so that they pass upward through the regenerators, become heated in their passage through them, and after combustion in the furnace pass downward through the regenerators, which absorb their surplus heat. This reversing the currents is done every half hour. The furnace is raised to a strong heat before the body is introduced, and after the body is in the furnace and the door closed, the amount of gas supplied to the furnace is gradually diminished, as the gases coming from the body are sufficient to support combustion. In this way no foul vapor can escape into the air, every particle being oxidized; and when the process is completed—which takes about half an hour—nothing is left in the furnace but a small quantity of white ash, which is carefully collected and placed at the disposal of the friends.

The Gorini furnace, used in Great Britain, Italy, and elsewhere on the continent of Europe, consists of a furnace, a chimney, and a flat-bottomed receiver, connecting with both. Any products escaping from the receiver are consumed by a second fire, of coke, kept burning in the base of the chimney; hence there is no smoke or offensive odor. The time required for the combustion of an adult varies from one and a quarter to one and three-quarter hours, and the ashes weigh from 5 to 7 lb. The Venini furnace, used in some crematories in the U. S., reduces a body in about one hour and a half. The literature of the subject, all of comparatively recent date, is abundant. See H. Thompson, *Treatment of the Body after Death* (London, 1874), and *Modern Cremation* (London, 1889); Ullersperger, *Urne oder Grab* (1874); Leach, *Cremation* (London, 1884); Erichsen, *The Cremation of the Dead* (1887); Cameron, *The Modern Cremation Movement* (Paisley and London, 1888).

SAMUEL SEXTON.

Cremer, AUGUST HERMANN, D. D.: German theologian; b. in Unna, Westphalia, Oct. 18, 1834; educated at Halle and Tübingen; from 1859–70 pastor at Salst; since 1870 Professor of Theology in the University of Greifswald; author of the *Biblico-Theological Lexicon of N. T. Greek*, of which the seventh edition appeared (Gotha, 1892) in the German original and the third in the English translation (Edinburgh, 1886). HENRY E. JACOBS.

Crémieux, krā'mi-ö', ISAAC ADOLPHE: French advocate and republican; b. of Jewish parents at Nîmes, Apr. 30, 1796. He practiced as an advocate in the court of cassation in Paris. In 1842 he was elected a member of the Chamber of Deputies, in which he acted with the radical party. He was minister of justice in the provincial government (1848), and retired from office in June. He was a member of the National Assembly in 1849–50. In Sept., 1870, he became minister of justice after the deposition of Napoleon III. As president of the Universal Israelite Alliance of Paris, he displayed a remarkable activity in behalf of the Jews all over the world. D. at Passy, Feb. 10, 1880.

Cremnitz: same as KREMNITZ (*q. v.*).

Cremo'na: a province of Italy; bounded N. by the provinces of Bergamo and Brescia, W. by Milan, S. by Piacenza, Parma, and Reggio, and E. by Venetia. Area, 632 sq. miles. The soil is fruitful, producing grain, maize, rice, flax, wine, olives, etc. Capital, Cremona. Pop. (1881) 302,064; (1890) 305,214.

Cremona: a city of Italy; capital of the province of same name; in Lombardy; on the Po; here crossed by a bridge; 47 miles S. E. of Milan (see map of Italy, ref. 3–C). It is surrounded by walls, is well built, with wide streets, and has handsome palaces and a cathedral. Connected with the cathedral is a belfry called il Torazzo or the great tower, 372 feet high, completed in 1284, and one of the most beautiful towers in Italy. Cremona is a bishop's see, and has a city-hall, two theaters, a lyceum, a public library, and several hospitals. Here are manufactures of silk and cotton fabrics, porcelain, and chemical products. It was formerly celebrated for the violins of the Amatis (1590–1620), of the Guarneris, and of Stradivari (1670–1728). Cremona was a populous town during the ancient Roman empire. Pop. 37,400.

Crenelle', or **Crenel**: a battlement, or an embrasure in a battlement. The word *crenellated* is employed to signify that a building is supplied with crenelles. In its French form (*crenelé*, crenellated, embattled) the word is also used in heraldry and signifies broken into battlements, or square projections; thus a fesse *crenelé* has one edge so embattled.

Creole [Fr. *créole*: from Span. *criollo*, a deriv. of *criar*, create, nurse, bring up, educate]: a native of the West Indies or South America who is descended from Europeans. The term is sometimes applied erroneously, and *not* in the West Indies, to those whose ancestors were partly white, and have in their veins some blood of the Indians or Negroes. The word is used adjectively, and applies to other things than man; thus creole chickens are those from a recently imported European or other stock. R. STURGIS.

Cre'osote, or **Creasote** [from Gr. κρεο-, the combining form of κρέας, flesh + σώζειν, save]: a sirupy liquid obtained for commercial purposes chiefly from wood-tar and coal-tar, especially from the latter. Both varieties of creosote are very complex mixtures of compounds related to phenol or carbolic acid, and of various hydrocarbons (see HYDROCARBONS), as naphthalene, phenanthrene, anthracene, etc. Wood-tar creosote has a strong, penetrating odor resembling that of wood-smoke. It is a good antiseptic, and has become a valued remedy in tuberculosis of the lungs. Coal-tar creosote is very extensively employed for preserving timber, for softening hard pitch, as a fuel, as an antiseptic, and as a cattle wash for the purpose of destroying animal parasites. It is generally adulterated in commerce with a large percentage of phenol (see CARBOLIC ACID), which can with difficulty be detected. It is also employed in toothache, in obstinate vomiting, and as an outward application in cancer. In an overdose it is an irritant poison, for which any soluble sulphate (as magnesium sulphate) is an antidote. Revised by IRA REMSEN.

Creosoting: See PRESERVATION OF TIMBER.

Crescen'do [Ital., increasing]: in music, a gradual increasing of sound, or changing from piano to forte and fortissimo. It is marked thus <, or with the abbreviation *cresc.*

Cres'cent [from Lat. *cres'cere*, grow, increase]: the figure of the new moon. The standard of the Turkish army bears the figure of a crescent; the word "crescent" itself is often used figuratively for the Turkish military power. It had also been the emblem of the Greeks before the conquest of the Eastern empire by the Turks, and was used by Genghiz Khan's Tartars and other nations of Central Asia.

Crescent, Order of the: an order instituted at Angers in 1464 by René, Duke of Anjou, brother and heir-apparent of the Neapolitan king, Louis III. The badge was a crescent of gold, on which the words "Loz en Croissant" ("Praise to that which increases") were enameled in red letters. Its aims were those common to all military and religious orders—defense of the Church and of the innocent suffering, deference to ladies, and to all divinely appointed authorities, etc. The order is not known, however, to have survived its founder. The Turkish decoration of the Crescent, sometimes called an order, was instituted by Selim III. after the battle of Abukir, 1799, and was designed to be given only to Christians who in some way or other had aided the sultan. The first to receive it was the British admiral Nelson.

Cres'co: city; capital of Howard co., Ia. (for location of county, see map of Iowa, ref. 2–I); on the C., M. and St. P. R. R.; 60 miles W. of the Mississippi river. It has seven churches, a high school, a parochial school, foundries, brick and tile works, flour-mills, creameries, etc.; it is the center of large dairy, poultry, hog, and cattle interests. Pop. (1880) 1,875; (1890) 2,018; (1900) 2,806.

EDITOR OF "HOWARD COUNTY TIMES."

Cre'sol [from *creo*sote + alcoh*ol*; called also **Cresyl'ic Ae'id** and **Cres'yl Al'cohol**]: a compound (C_7H_8O) derived from coal-tar or from wood-tar by fractional distillation. Most of the CARBOLIC ACID (*q. v.*) of commerce contains a large percentage of cresol. It combines with alkalies, like its analogue phenol, and hence is by some called an acid; it is isomeric with benzyl alcohol, and is itself properly one of the alcohols. It refracts light strongly, and boils at 397° F. It is not identical with carbolic acid, but is used in its place as a disinfectant.

Cresses: plants having a pungent taste and diaphoretic and other medicinal qualities; belonging chiefly to the natural order *Cruciferæ*, and found in the temperate and northern parts of the earth. Many are used as articles of food. The common cress, *Lepidum sativum*, an annual and a native of Asia, has been introduced into other countries. In the U. S. it is usually sown out of doors in the autumn or very early in spring. It is used as an antiscorbutic during Arctic voyages. The Virginia cress (*L. virginicum*) is cultivated as a salad in North America, the West Indies, and Great Britain. The bitter cress (*Cardamine amara*), the lady's smock, or cuckoo flower, as it is called in England (*C. pratensis*), and the hairy cress (*C. hirsuta*) are found both in Europe and North America. Water-cress (*Nasturtium officinale*) is a perennial, aquatic plant, used as a spring salad, and is a native of almost all parts of the world. The leaves have a pungent taste, to which is added a little bitterness and saltness. They are very refreshing, however. It grows best in shallow running water with a bottom of sand. It is often cultivated and brought to market in North America and Europe. See NASTURTIUM.

Cres'son: railroad junction; Cambria co., Pa. (for location of county, see map of Pennsylvania, ref. 5–D.); 252 miles W. by N. from Philadelphia and 102 miles E. of Pittsburg. It is beautifully situated on the summit of the Alleghany Mountains, about 3,000 feet above the level of the sea. It is a fashionable place of summer resort. Pop. of township (1900) 1,572.

Cressy, in France: See CRÉCY.

Crest: something worn on the helmet in ancient warfare. Among the Greeks it was often of horsehair, forming a stiff ridge along the top, but falling in a long soft appendage behind the nape of the neck. Among the Romans it was sometimes of stiff upright feathers, but was not in general use as an ornament. In the Middle Ages, as the helmet often covered and concealed the face, the crest became a means of knowing the wearer. It was often very elaborate, made of thin metal or of boiled leather, and painted in rich colors.

In heraldry, an appendage to the escutcheon, usual though not necessary in a man's *achievement*, or general display of armorial bearings, but not in place in the achievement of a woman. It is carried upon a so-called *wreath*, which is sometimes put above a helmet, and sometimes directly above the escutcheon.

Crested Butte: city; Gunnison co., Col. (for location of county, see map of Colorado, ref. 4–C); on branch of Denver and Rio Grande R. R.; 18 miles N. of Gunnison. It is engaged in mining gold, silver, and coal, and in manufacturing coke. Pop. (1890) 857; (1900) 988.

Crestline: city and railway junction (founded in 1850): Crawford co., O. (for location of county, see map of Ohio, ref. 3–F); 63 miles N. by E. from Columbus. Here are 6 churches, 2 schools, extensive shops of the Penn. R. R., lockworks, a furnace, and artesian water-works. Pop. (1880) 2,848; (1890) 2,911; (1900) 3,282. EDITOR OF "ADVOCATE."

Creston: city and railway junction; capital of Union co., Ia. (for location of county, see map of Iowa, ref. 7–F); 190 miles W. of Burlington. It has several banks, a graded school, wagon-factories, and large machine-shops and car-works. Pop. (1880) 5,081; (1890) 7,200; (1900) 7,752.

EDITOR OF "ADVERTISER."

Creswell, JOHN A. J.: lawyer; b. at Port Deposit, Md., Nov. 18, 1828; educated at Dickinson College, Carlisle, Pa.; became a prominent lawyer; allied himself with the Whigs, the Democrats, and finally with the Republicans. He was appointed adjutant-general of Maryland in 1862; in the same year was chosen a Republican member of Congress, and in 1865 was elected a Senator of the U. S. for a short term. He was a member of the convention which renominated Lincoln, and of that which nominated Grant. In Mar., 1869, he was appointed Postmaster-General of the U. S. He resigned in Mar., 1873, and was then reappointed, serving until July 3, 1874. D. at Elkton, Md., Dec. 23, 1891.

Cresylie Alcohol, or **Cresylic Acid**: See CRESOL.

Cre'ta [Lat., chalk, originally Cretan earth]: a pharmaceutical name for chalk (native carbonate of lime) and for the precipitated carbonate of lime. The former is more generally used. The chalk is powdered, washed, and dried, and is then known as *creta præparata* (prepared chalk), an excellent antacid remedy. *Creta præcipitata* (the chemically prepared chalk) is more finely divided. See CHALK.

Cretaceous Period: the division of geologic time following the Jura-Trias and preceding the Eocene. In England and France, where the name cretaceous was first used, the principal formation representing the period is of chalk, and chalk-beds are also found in Texas and Arkansas, but in other regions the name is not descriptive of lithologic character. The life of the period is profusely represented by fossils; among the more characteristic are the *Rudistes*, an aberrant family of lamellibranchs; ammonitids with shells partly uncoiled; and birds with teeth. Cretaceous rocks have a great development in North America. They occupy a belt on the Atlantic coastal plain from New Jersey to Texas; cover an immense area on the Great Plains from Texas to Athabasca; reappear frequently among the mountain-ranges of Wyoming, Colorado, Utah, Arizona, and New Mexico; are greatly developed in the mountains of Northeastern Mexico; and appear at many points on the

Pacific coast from California to British Columbia. W. of the 100th meridian they contain an important store of coal, a store that when fully explored may be found to exceed that of the Carboniferous rocks of the Mississippi basin and Appalachian region. A compendious treatise on the North American Cretaceous, by Dr. Charles A. White, is contained in Bulletin No. 82 of the U. S. Geological Survey. See DAKOTA FORMATION, FOSSIL INVERTEBRATES, FOSSIL PLANTS, FOSSIL VERTEBRATES, GEOLOGY, HISTORIC; and LARAMIE.

G. K. G.

Crete, or **Can'dia** (Gr. Κρήτη; Turk. *Kiridi*): a large and famous island of the Mediterranean; between lat. 34° 57′ and 35° 41′ N., and lon. 23° 29′ and 26° 20′ E. It is 150 miles long, and from 6 to 35 miles wide. Area, 2,949 sq. miles. The surface is mountainous. Mt. Ida rises near the middle of the island to the height of 7,674 feet. Numerous caverns occur here, and an extensive one near Mt. Ida is fabled to have been that which was anciently the retreat of the Minotaur. Among the minerals are limestone and slate. The chief products of Crete are cotton, tobacco, olive oil, grapes, oranges, lemons, wine, silk, and wool. The population in ancient times is believed to have amounted to 1,200,000, and at the time when it was acquired by the Venetians to 500,000; it was estimated in 1885 at 294,192, of whom about 50,000 are Mohammedans, nearly all the others being Christians belonging to the Greek Church, which has eight bishops in the island. Most of the Mohammedans, however, are Greek by descent, and Greek is the only language spoken in the island.

History.—Crete is by some historians considered the cradle of the civilization brought to Europe by the Phœnicians and Egyptians. According to tradition, Minos, a celebrated legislator, reigned over this island before the beginning of the historical period. In the time of Homer, Crete had a dense population of the Hellenic race, and contained a great number of flourishing cities. Crete was visited by the apostle Paul, who planted a church in it. The Venetians became masters of this island in 1204. The Turks conquered it from the Venetians in 1669. In 1866 the Christian inhabitants revolted against the Turks, and demanded annexation to the kingdom of Greece. This war excited much sympathy among Christian nations, but the Cretans were subdued in 1869. They obtained, however, a kind of constitution, but bad government has caused insurrections, especially in the spring of 1897, resulting in evacuation by the Turks in 1898.

Crete: city and railway junction; Saline co., Neb. (for location of county, see map of Nebraska, ref. 11–G); 20 miles from Lincoln. It has several manufactories, and is the seat of Doane College. Pop. (1880) 1,870; (1900) 2,310; (1900) 2,199.

Crétineau-Joly, krā'tēē'nō' *zhō* lee', JACQUES: French author; b. in Fontenay, Sept. 23, 1803; studied theology in Paris, and wrote a number of works in defense of the interests of royalty and the Catholic Church. He is best known by his *History of the Jesuits* (6 vols., Paris, 1844–46; 4th ed. 1856), an elaborate work in defense of that order and at their request. Among his other works are *Histoire de la Vendée Militaire* (4 vols.; 5th ed. 1864); *Histoire de Louis Philippe* (2 vols., 1861–63; 2d ed. 1867); *Le Pape Clément XIV.* (1853). D. in Vincennes, Jan. 1, 1875.

Cret'inism (in Fr. *crétinisme*): a form of congenital disease in which mental and physical deformities are prominent. It has been found especially in certain parts of Switzerland and Central Europe, in the Himalayas and in other parts of Asia, and to a slight extent in America. The inhabitants of the valleys between mountain chains are especially prone to be affected, and it has been suggested that the prevalence of the disease was due to lime salts or other constituents in the waters used by the people of the affected localities. It is probable that the character of the water is of less significance than has been believed, and the special frequency of cretinism in regions abounding with magnesian limestone may depend upon other causes. Not rarely there is distinct evidence of hereditary transmission, and in some situations a large part of the population may be more or less affected. Cretinism is recognized to be dependent upon disease of the thyroid gland, or at all events some of the prominent symptoms depend upon such disease. The cretin is imbecilic or idiotic, and may be completely devoid of capability for intellectual development.

Physically the disease is highly characteristic. The body remains dwarfed, and perhaps distorted by disease and deformity of the bones. The head may be small, with retreating forehead and broad top, or it may be unusually large; the nose is flat, the mouth large, and the tongue broad, thick, and protruding. The eyes are small and frequently deep-set, being covered by thick brows and lids. The hair of the head may be scanty, and the body is generally completely hairless. The skin is dry and harsh, often ashen or yellowish in color, and the subcutaneous tissues may be thickened, causing the skin to hang in folds in various parts. The cretin is usually dirty, and has a voracious appetite.

The treatment of cretinism has received a notable addition within recent years in the administration of thyroid gland or extracts of the thyroid gland of animals, or in the implantation of the thyroid gland of animals into the cretin's body. Decided improvement, and sometimes almost cure results.

WILLIAM PEPPER.

Creuse, kröz: a department near the center of France; area, 2,151 sq. miles. The surface is mostly mountainous. The principal mineral productions are coal and salt. Capital, Guéret. Pop. (1881) 278,782; (1896) 279,366.

Creusot, Le, or **Le Creuzot**, *le*-krö'zō': town of France; department of Saône-et-Loire; 12 miles S. S. E. of Autun (see map of France, ref. 5–G); in the midst of rich mines of coal and iron. It has extensive blast furnaces, foundries, machine-shops, and glass-works. Pop. (1896) 32,034.

Creuzer, kroit'ser, GEORGE FRIEDRICH: German philologist and antiquary; b. at Marburg, Mar. 10, 1771; became Professor of Philology and Ancient History at Heidelberg in 1804, and retained that position for forty-four years. His principal work is the *Symbolism and Mythology of Ancient Peoples, especially the Greeks* (4 vols. 8vo, 1810–12). He ascribed to the pagan myths a mystical significance and a supernatural origin, a theory which was fiercely attacked, especially in Voss's *Antisymbolik*. He also edited the Oxford *Plotinus* (3 vols., 1835). His numerous German treatises have been collected in 4 vols. (Leipzig, 1848). D. in Heidelberg, Feb. 15, 1858. See his autobiography (1847); B. Stark, *Fr. C. sein Bildungsgang und seine bleibende Bedeutung* (Heidelberg, 1875); Bursian, *Geschichte der Philologie in Deutschland* (Munich, 1883).

ALFRED GUDEMAN.

Crevaux, JULES: See the Appendix.

Crew: the body of men employed in a vessel of any kind as distinct from the officers. The commander of a U. S. man-of-war is required to send to the Navy Department upon commissioning, and quarterly thereafter, a muster-roll of the crew, which includes petty officers, seamen, and marines. Prior to clearance, the master of a merchant vessel is required to deliver to the collector of customs his crew list. By the U. S. Postal Subsidy Act of 1890 one-fourth during the first two years of the contract, one-third during the three succeeding years, and one-half thereafter of the crew of a subsidized vessel shall be citizens of the U. S.

Crewe: town of Cheshire, England; 34 miles S. E. of Liverpool (see map of England, ref. 8–G). It has one of the largest railway stations in England, works for the construction of railway carriages and locomotives, and a park of 40 acres. Pop. (1891) 28,761.

Crib: See FOUNDATIONS.

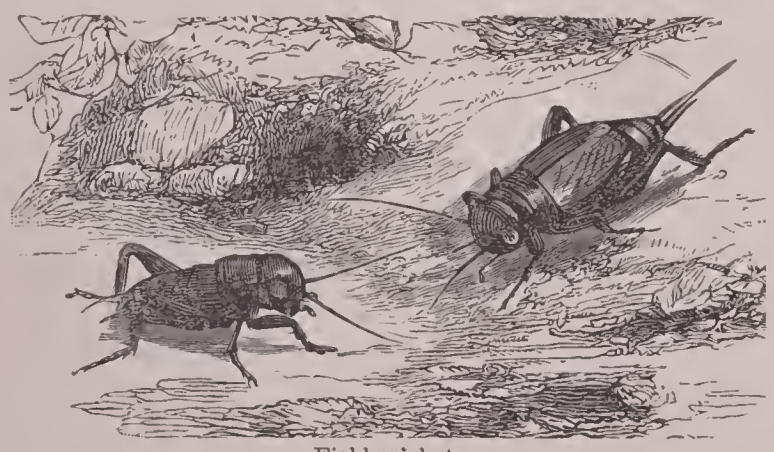
Cribbage [from *crib*, as used in the game]: a game at cards, usually played by two persons. The game is sixty-one points, which are scored with pegs on a board called a cribbage-board having sixty-one holes on each side. In the U. S. the game, when two or four play, is decided by the winning of two out of three *legs*. Where three play, the first out in a double circuit of the board is the winner. When cribbage is played by three persons a three-cornered board is used. In this case each player receives five cards, and an extra card is dealt, which is added to the crib. When four persons play each has a partner, and each receives five cards, of which he discards one to form the crib. When only two persons play, six cards are dealt to each player, and each discards two, to form what is called the *crib*, which belongs to the dealer. The pack is then cut, and the dealer turns up a card, called the *turn-up*, which is reckoned in scoring as belonging to all the hands and the crib. The cards held in the hands are then played alternately, counting the pips or spots (face cards counting ten) up to thirty-one, for which two is scored to the person playing the card that makes it, and scoring in the same way for every combination made according to any of the following rules: Any combination of cards the united spots of which make up fifteen scores two points. A sequence

in rank (without regard to suit) of three or more cards scores one for each card. Two similar cards of different suits (as two fives or two knaves) form a *pair*, and score two; three form a *pair-royal*, and four a *double pair-royal*, scoring respectively six and twelve. When the cards are all played each hand is counted by itself, according to the same rules. For example, a hand containing two sevens, an eight, and a nine, with an eight turned up, would score twenty-four; four fifteens (produced by the different combinations of eight and seven) = 8; four sequences of three each = 12; two pairs = 4. If the cards in either hand, or the cards in the crib and turn-up, are all of the same suit, it is called a *flush*, and one is scored for each card. If a knave of the same suit as the turn-up be in either hand or in the crib, the holder scores one; when the turn-up is a knave the dealer scores two. During the play, when it is found impossible to count to thirty-one without passing that limit, it is called a *go*, and the last player scores one.

Crichton, krī'tŭn, James: called The Admirable Crichton; b. in Perthshire, Scotland, Aug. 19, 1560; a son of Robert, lord-advocate of Scotland. Educated at St. Andrews, before he was twenty he had run through the entire circle of sciences. He could speak in ten languages, and was adroit in all manly accomplishments. He journeyed through Europe about 1580, challenging all scholars to a learned disputation in any of twelve tongues. He vanquished all the doctors of all the universities; moreover, he disarmed the most famous swordsman of the time in fencing, and by his grace and manly beauty his amorous triumphs were not less distinguished. He found his death between 1585 and 1591, at the hands of Vincentio, son of Gonzago, the Duke of Mantua, a dissolute youth whom he had roughly jostled in a carnival encounter. "He was," says Scaliger, "a man of very wonderful genius, more worthy of admiration than esteem." The stories of his accomplishments are no doubt exaggerated. He published Latin verses and prose essays of no great value. See P. F. Tytler, *Admirable Crichton* (1823), and the article in the *Dictionary of National Biography*.

Crichton-Brown, Sir James, M. D., LL. D., F. R. S.: English physician; b. in Edinburgh, 1840; educated at Trinity College, University of Edinburgh, and the medical schools of London and Paris; is vice-president and treasurer of the Royal Institution of Great Britain, and member of many learned societies; author of a large number of monographs on physiology and pathology of the nervous system. As head of the West Riding Asylum, he made it famous, not only for good management, but also as a center of successful research.

Cricket: the popular name of certain orthopterous insects, nearly allied to locusts and grasshoppers, the type of the family *Gryllidæ*. The wings, being horizontally folded, form a slender point beyond the wing-covers. In virtue

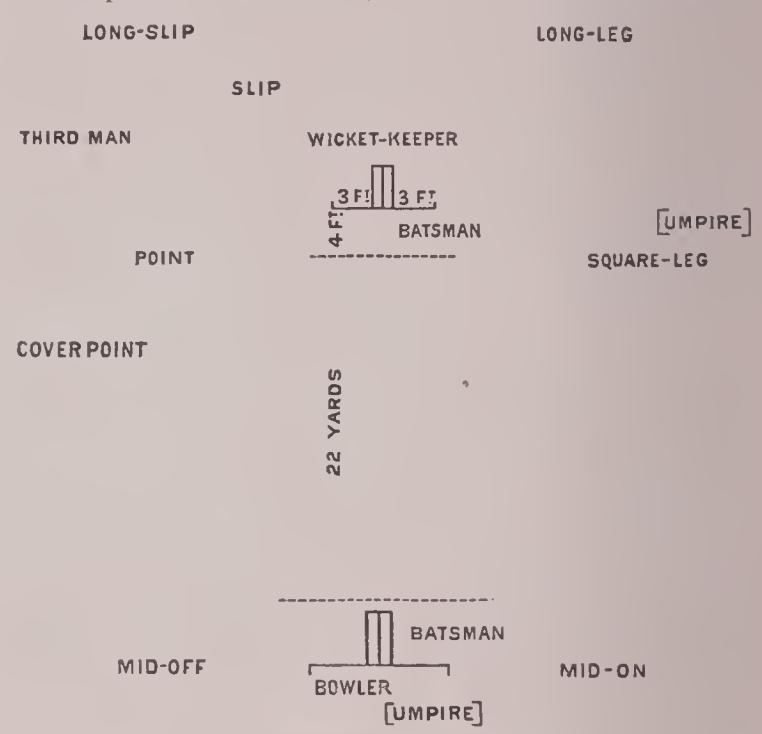


Field-cricket.

of a peculiar formation of the wing-covers, and by their friction, the males produce that stridulous sound by which these insects are so well known. Of the typical genus *Gryllus*, the U. S. have several species, including the common black crickets, *Gryllus abbreviatus* and *Gryllus neglectus*, this last being the most abundant cricket in the New England and Northern Middle States. The house-cricket of Europe, *Gryllus domesticus*, has become naturalized in the Eastern U. S., where it is frequently met. The common mole-cricket of the Northern U. S., *Gryllotalpa borealis*, has wings shorter than the mole-crickets of Europe. The mole-crickets construct chambers for their eggs beneath the surface of the earth, and the passages leading to these cells are long and tortuous, like those of the mole. The climbing crickets (*Œcanthus*) are represented in the U. S. by several species. They are often found upon weeds and shrubs.

Revised by F. A. Lucas.

Cricket: a game played by two sides, of eleven men each, on a smooth field, of which the smoothest and fairly central portion is called the "crease," a strip of ground 22 yards long, at each extremity of which is pitched a "wicket." This wicket, 27 inches high and 8 inches wide, consists of three "stumps," or upright sticks, of sufficient thickness to prevent the ball from passing between two of them, and supports in shallow grooves two "bails" or cross-pieces, placed end to end, which rest so lightly on the stumps that a slight touch of the ball knocks them off. A space marked by a white-wash line, extending 3 feet on each side of the wicket, and a parallel line of indefinite length, at a distance of 4 feet toward the opposite wicket, is the "popping-crease," or batsman's position. Two batsmen represent the eleven at bat ("in"); the other eleven take the "field," in the following normal positions, which may be varied with the character



Arrangement of the players.

of the bowling. If the bowler hits the wicket at which he is bowling with his ball, the batsman is "out," and yields his place to another of the same side. If, on the contrary, the batsman strikes the ball with his bat, and so defends his wicket, and if the ball so hit is neither caught nor stopped by fielders, he may make a "run," i. e. exchange his own popping-crease (see cut) for that of his companion at the other wicket, who makes a corresponding exchange; and if he knocks the ball far enough, may make two, three, sometimes as many as six runs, which are credited to his account in the "score-book." If he fails to touch the ball and it misses the wicket, he may also run ("a bye)," which counts for his side, but not in his individual score; and this holds good of the "leg-bye," where the ball glances off from his person (the hands excepted); of the "wide," where the ball is bowled out of the batsman's reach; and of the "no ball," where the bowler in delivering the ball fails to keep one foot behind the line of the stump, called the bowling-crease, or else "throws or jerks" instead of bowling; but "wide" and "no ball" count in the score without any necessity of running on the part of the two batsmen. Each side has two "innings"; whichever secures the greater aggregate of runs wins the match. A batsman is "out" (1) if his wicket is "bowled"; (2) if he stops with his leg a ball that would otherwise hit the wicket; (3) if he knocks down his own wicket; (4) if he picks up the ball, or (5) obstructs a fielder, or (6) hits a ball twice; (7) if he hits a ball which is then caught by a fielder before it touches the ground; (8) if, in playing at the ball, he goes out of his "popping-crease," and the wicket-keeper can then, with the ball, knock off the bails ("stumped out"); (9) if, in attempting to run, the same thing happens ("run out"). Judgment whether or not a player is out is business of two umpires, one of whom stands by the bowler, the other not far from square-leg. Four (in the U. S. mostly six) balls are bowled in succession from one wicket (an "over"), when fielders change positions, and

another man bowls an "over" from the opposite end; this alternation is kept up through the entire game.

The Implements.—These are expensive, and are made in Great Britain. The ball weighs 5½ oz.; the bat, with a maximum length of 38 inches, has a "blade" of English willow 2 feet long, and not over 4¼ inches wide, flat on the face and convex on the back, and a spliced elastic cane-handle, about a foot in length, carefully wrapped with thread. "Pads" or guards are used for the batsman's legs, and he often adds gloves for his hands. The wicket-keeper is similarly protected.

Science of the Game.—Cricket is practically a duel between bowler and batsman, though the latter is alone and the former has ten men to help him. Recent progress has consisted in finer skill and greater daring on the batsman's part; and on the bowler's part in greater freedom as regards the delivery of the ball (a process analogous to the course of "pitching" in baseball), in greater skill in the control of it, and in a closer co-ordination of the bowling and the fielding. Once confined to "underhand" delivery, then restricted to the "round arm," where the hand was not raised above the shoulder, he may now deliver as he pleases, but must not *jerk or throw*. Slow overhand bowling is a modern art. The "headwork" of bowling is now its main feature. Every ball should be delivered with a purpose, with this or that "break" (spin or twist) and "pitch" (that spot where the ball hits the ground in front of the batsman), and often with deliberate intent to let the batsman hit it ("bowling for catches"). Hence the necessity for changing fielders' positions to suit the bowling. This improvement in bowling has hardly kept pace with the better science of modern batsmen, and scores are growing larger every season. Early cricket knew little but hard hitting; with fast bowling came an era of "blocking" (stopping the ball); nowadays the free hitter is at the front—such a man as the "champion," W. G. Grace, of England, who, in 1876, made 344 runs in one inning. Briefly, the object of batting is to hit the ball, (1) along the ground, and (2) hard enough to make runs. A quick and accurate eye, combined with rapid judgment, makes the player. Theory counts for little compared with practice; but every cricketer must remember to keep his right foot firmly in place, to play mainly forward, with the left shoulder and elbow well in front, the bat perpendicular, and to take the ball at its pitch. The chief hits are the drive, forward to mid-off or mid-on, and the cut, at right angles to the batsman or behind him, toward cover-point or the slips; the former is done chiefly by shoulders and arms, the latter by the wrists. "Slips" and "snicks" are useful with fast bowling, and a good hit to leg is always welcome, though modern bowlers seldom give the opportunity.

History of the Game.—The origin of cricket (as regards both the name and the game) is obscure. "Cricket" may be a diminution of *crice*, the old word for "staff," or, as Mr. Lang suggests, it may have stood, as it does now, for a stool, and the game may have been developed out of "stool-ball." In 1611 Cotgrave's *Dictionary* translates French *crosse*, "a cricket staffe, or the crooked staffe wherewith boies play at cricket." In Queen Elizabeth's reign, by documentary evidence, the boys of the free school at Guildford played cricket; and this is the earliest direct mention of the game. By the eighteenth century it is mentioned on all sides. Laws were drawn up for the game in 1744; and contemporary pictures show us a small wicket (two stumps and one bail), with a bat combining the characteristics of a base-ball bat and a modern shinny-stick. Toward the end of the century all this was materially changed, bat and wicket; round-arm bowling began, and at last (in 1827) Lillywhite raised his hand above the shoulder, and so, not without great controversies, began the era of modern bowling. About 1787 the Marylebone Club was organized; its rules are recognized as supreme authority in cricket. In Great Britain a sharp line is drawn between "professionals" or "players" and the "gentlemen"; but in the U. S. professionals are few, and are mainly employed as bowlers and coaches by local clubs. The university, school, and county matches in England are of national importance, and since 1846 the All-England Eleven has repeatedly played international games, the most noteworthy being those with Australia.

In the U. S. cricket had been played as a provincial rather than national game by British residents and a few others, until the independent interest of natives infused vigor into its career and put it upon its present basis. The center of this movement was Philadelphia, which, indeed, still holds the best and largest clubs of the country. Representative English elevens crossed the ocean and played matches with All America or All Philadelphia, the native side often counting twenty-two men; under this pressure cricket in the U. S. made rapid strides in improvement, so that nowadays an international match of the first class is confined to eleven on each side, is a matter of yearly occurrence, and is often won by the U. S. eleven. The championship of the U. S. is at present held by the Germantown Club of Philadelphia, which has defeated its national rivals as well as the best elevens of Canada. In New England, and even in the West, cricket is spreading rapidly. It does not rival base-ball in popularity, but it has a large and increasing body of adherents.

Books on Cricket.—Many books have been written about the game, but we need mention only Pycroft's *The Cricket Field* and the recent standard work of the Badminton Library, *Cricket*, by Steele and Lyttelton. This contains a mine of information, antiquarian as well as practical, and should be in the hands of every cricketer. Journals of cricket are published, giving the scores of important matches and current gossip of the same. F. B. Gummere.

Crillon, krĕĕ′yōn′, Louis des Balbes de Berton, de: French warrior; b. in Provence in 1541. He served at the siege of Calais in 1558, and fought against the Huguenots in the civil wars. He distinguished himself at Jarnac and Moncontour, and at the naval battle of Lepanto (1571). During the reign of Henry III. he fought for that king against the Catholic League. In 1589 he entered the service of Henry IV., who styled him "the bravest of the brave." He contributed to the victory at Ivry (1590), but after the peace of Savoy retired from public life. D. Dec. 2, 1615. See Serviez, *Histoire du brave Crillon* (1844); Abbé de Crillon, *Vie de L. des Balbes de Berton de Crillon* (3 vols., 1826.)—A descendant of "the brave" Crillon, Louis (1718–96), was a distinguished general of the Thirty Years' war, and in the service of Spain became Duke of Mahon, and commanded at the futile investment of Gibraltar in 1782.—His grandson, Duc de Mahon (1775–1832), a Spanish general, was viceregent of Navarre under Joseph Bonaparte.

Crime [viâ Fr. from Lat. *crimen*, judicial decision, charge, connected with *cer'nere*, discriminate, note, determine]: any act done in violation of those duties which an individual owes to a community, and for a breach of which the law has provided that the offender shall make satisfaction to the public. The ascertainment of these duties, which society imposes upon its members for the general welfare, is derived either from the common concurrence of the moral sentiments of any community or from the enactment of specific laws defining and enforcing particular obligations. Offenses against the one variety of duties are said to be *mala in se* (wrongful in themselves), while those against the other are designated *mala prohibita* (wrongful because prohibited by statute). As a general practice, however, legislative prohibition is also extended to the case of crimes which are strictly *mala in se*, both to provide against uncertainty and fluctuation of opinion and to create additional sanctions; so that the precise original distinction between the two classes is no longer preserved. The laws of England recognize a larger variety of crimes not depending upon statute than is generally the case in the U. S. But even in the U. S., as a rule, there are still some offenses for which the common law alone makes provision.

By the common law crimes are divided into two great classes—felonies and misdemeanors. The distinction is based upon the relative enormity of various offenses. Thus the term "felony" includes those which are of greatest magnitude, while "misdemeanor" is reserved for the residue. But nevertheless an understanding of the exact extent of meaning of these two designations can only be attained by an indirect mode of definition—viz., by showing the diversity of punishment in the respective cases. A felony was originally any crime for which the penalty might be a forfeiture of lands or goods; a misdemeanor was one which entailed a milder punishment. In some of the U. S. the punishments distinguishing felonies have been changed, and are now either death or imprisonment in a State prison. In others, while the common-law distinction has been discarded, no different one has been adopted to supply its place, so that the two terms are used without precision or definiteness of meaning.

In order that a person may be guilty of a crime there

must be a concurrence of capacity, intent, and wrongful act. The questions of capacity and intent are, in fact, closely related, since the law adjudges a person incapable of a criminal offense only because it presumes him incompetent to form a criminal purpose. The principal causes of incapacity are infancy and the want of mental soundness. Infancy exempts from responsibility only when children are so young as to have no acquaintance with the nature of a criminal offense. At the common law a child under seven years of age is conclusively presumed to be unable to commit a crime; between seven and fourteen, his liability depends upon his actual discretion, which must be determined in each particular instance by special proof; after fourteen he is considered presumptively capable. The want of proper mental capacity to form a criminal intention exists in the case of idiots, lunatics, and all persons who are either permanently of unsound mind, or so deranged at the time of the commission of any wrongful act as not to be aware of its guilty character. Exactly what degree of mental alienation should be sufficient to exempt from responsibility is a matter difficult to determine. The only criterion that can generally be adopted is the wrongdoer's power of appreciation of the wrongful nature of the particular act which he committed. (See INSANITY.) Voluntary drunkenness, however, though it may confuse and disorder the moral perceptions, and produce a kind of temporary insanity as pernicious in its effects as natural aberration, affords, in general, no defense for the criminal offender. Only where a specific intent is an essential element to constitute a crime can a person intoxicated be excused for that particular offense. As a rule, the intent to drink is sufficiently culpable to make the resulting act punishable. If, however, true insanity or delirium tremens should be produced as a consequence of intoxication, and the victim of it should commit an act which if he were sane would be a crime, he will be excused. The law in that case only regards the fact of insanity, without reference to the means by which it has been occasioned. Besides these natural incapacities which exempt from penalty, there exist certain other causes for exoneration, such as duress and coverture. Whenever an offense is not perpetrated voluntarily, but under the compulsion of force or fear, there is wanting that willing pursuit of crime which is alone a just reason for condemnation. In like manner, the stress of overwhelming necessity relieves from guilt the involuntary wrong-doer. Coverture also, or the condition of a married woman, exempts from liability in some instances, because her action is considered to have been occasioned by constraint exerted by her husband. Thus all crimes committed by a wife in the presence of her husband, except some of a graver class, as treason, murder, robbery, and the like, are presumed to be done by coercion. This presumption is not a conclusive one, but relieves a married woman from any consequence of her action until rebutted by direct evidence that the crime was exclusively of her own commission. This mode of justification by alleging constraint only applies to married women. Servants and children are not excused, though acting under the command of masters or parents.

The necessity for the existence of a criminal intent in order to make a person responsible for his wrongful acts forms an important distinction between criminal and civil liability, for in civil cases intent need not generally be proved. It has always been a well-recognized maxim in criminal jurisprudence that "the act does not make a man guilty unless his purpose also be guilty." But the intention need not necessarily contemplate the commission of the particular consequence which results. In most instances, of course, the act done will be the specific act intended. But yet, if there be a purpose to perpetrate one crime, and the means used for its accomplishment unexpectedly result in a different offense or affect a person against whom they were not directed, there is still a sufficient connection of intent and act to warrant a holding to accountability. Thus if a man intends to shoot A and his act results in the death of B, whom he did not intend to injure, he is nevertheless responsible, as though he had actually intended to kill B. This principle, however, is not in all its rigor applicable when the crime committed is strictly in the class of *mala prohibita*, for the original purpose is not then deemed sufficiently reprehensible. A still different case arises where the preconceived intention had reference to the specific act performed, but did not include knowledge of its criminality, as where a person shoots game at a certain season when it is prohibited, without being aware that he is violating the law. In this class of instances it is likewise true that all the necessary elements of a crime are sufficiently present to justify punishment. The principle is that ignorance of the law must afford no excuse. If such were not the rule, all laws would be ineffective, for would-be offenders would be likely to abstain from examining their provisions, and thereby secure impunity. The accompaniment of intent and act, therefore, which will constitute criminal transgression, may occur in three different forms: First, the intent may be wrongful, and contemplate the very offense committed; second, the intent may be wrongful, but contemplate another offense than the one committed; third, the intent may be really innocent, but contemplate an offense which happens to be prohibited by law, and so criminal.

There are some cases in which, though no actual criminal intent is conceived, yet the law presumes its existence. When acts are characterized by such a degree of negligence or carelessness as to evince a culpable indifference whether wrong is done or not, the wanton disregard of commonly recognized duties is essentially criminal of itself. But if an unlawful act is committed, through mere accident or misfortune, in the prosecution of some legitimate undertaking, the unwitting offender is excused. In like manner, though ignorance of law affords no justification, ignorance of fact, where no reasonable opportunity is granted for acquiring correct information, is a valid excuse. The law may always be known when the facts can not be ascertained. "The guilt of the accused," it has been said as to these matters of fact, "must depend on the circumstances as they appear to him."

The necessity that an act must concur with the intent depends upon the principle that no mere mental conception or fancy, no matter how reprehensible morally, can ever be taken cognizance of at law without some overt expression of it in an objective result.

The parties engaged in the commission of crimes are distinguished either as principals or accessories. A principal in the first degree is one who is the actual, direct perpetrator of the offense. A principal in the second degree is one who is present, aiding and abetting the act to be done. An accessory is a participant in the wrong-doing in some more remote manner, either by procuration or assistance before the act, or after its occurrence by sharing in the profits acquired or shielding the immediate offenders from justice. In the one case he is called an accessory before the fact; in the other, an accessory after the fact. This distinction between principals and accessories is maintained only with reference to felonies, and even among these an exception is made of the crime of treason. There is no accessory before the fact in the common-law crime of manslaughter, for in it there is no preconceived intent to kill. In treason and in misdemeanors all the participants are deemed principals; in the one case, from the enormity, and in the other from the comparative triviality, of the offense. Where the distinction is preserved there is no reason for diversity of punishment as between principals and accessories before the fact. Accessories after the fact are not so severely punished, as their offense consists in an attack on the administration of justice. A wife is excused for thus shielding her husband. It was formerly the rule that the accessory could not be brought to trial before the principal, but this doctrine has been quite generally changed by statute.

The various crimes which may be committed are classified by legal writers in different ways. Blackstone in his *Commentaries* treats them as either offenses against morals and religion or the law of nations, or as against the existence of the government or state, such as treason, or against public order under the respective titles of public justice, public peace, public trade, public health or economy, and finally, against individuals. These last are subdivided into those which are committed against the person, against habitations, and against property. This classification is incomplete, and no place can be found in it for certain well-established crimes, particularly those which have been created by statute. The most satisfactory treatment of the subject is that adopted by Mr. Bishop, who discusses the general principles of law governing crimes, and then considers specifically each crime known to the law under an alphabetical arrangement. It should be noticed that the criminal law of the Federal Government is wholly created by statute, Congress having enacted so-called "Crime Acts." Under the State Governments the common law of crimes exists unless changed by statute. It will be impossible in this brief

notice to do more than to refer to some of the leading crimes, which are considered under their respective titles: Arson, Bribery, Burglary, Champerty, Cheating, Embezzlement, False Pretenses, Forgery, Gaming, Larceny, Libel, Mayhem, Perjury, Piracy, Polygamy, Rape, Riot, Robbery, Treason, Usury. For punishment of crimes, see Punishment.

In this brief account only the common-law doctrine of crimes could be considered. Upon this may be further consulted Blackstone, *Commentaries*, book iv.; Bishop, *On Criminal Law*; Bishop, *On Criminal Procedure*; Wharton, *American Criminal Law*; Russell, *On Crimes*; Hale, *Pleas of the Crown*; Hawkins, *Pleas of the Crown*; East, *Pleas of the Crown*; and Foster, *Crown Law*. The statutes of the States severally should also be referred to. Upon the general subject of criminal offenses, see Ortolan, *Droit Penal*; Beccaria, *On Crimes*; Mittermaier, *On Capital Punishment*, etc. See also the article Anthropology, Criminal.

T. W. Dwight.

Crime'a (in Russ. *Krim*; anc. *Taurica Chersonesus*): peninsula of Southern Russia; forming part of the government of Taurida, and nearly surrounded by the Black Sea and the Sea of Azof. It is connected with the mainland by the Isthmus of Perekop, 5 miles broad. Its length E. and W. is nearly 200 miles, and its area 9,850 sq. miles. The northwestern part of the Crimea is a treeless plain, the soil of which is impregnated with salt and fit only for pasturage. The southeastern part is occupied by wooded mountains and fertile valleys, but they are ill cultivated. The highest peak of these mountains is 5,450 feet above the level of the sea. Among the products are grain, grapes, olives, silk, honey, and wine. Many horses and cattle are reared here, and salt is exported. Marbles, porphyries, and coal are found. The chief towns are Simferopol, Sevastopol, and Baktshi-Serai, the old Tartar capital. It was conquered in the thirteenth century by the Tartars, who converted it into the khanate of Krim-Tartary. It was annexed to Russia in 1783. Pop. about 250,000, including Tartars (80,000), Jews, Gypsies, Greeks, Armenians, Russians, and Germans.

Crimean War: so called because it was chiefly waged in the Russian peninsula of the Crimea. It was carried on by France, Great Britain, Turkey, and Sardinia, against Russia. The aim of the allies was to check the growing power and encroachments of Russia, and to prop up the tottering throne of the Turkish sultan. One cause of the war was the claim of Russia to be the protector of the Greek Church in Turkey. After ineffectual negotiations between Russia and the Ottoman Porte, the Russian army entered the principalities in July, 1853, and war was declared by the sultan in October of that year. Early in Jan., 1854, the French and English fleets entered the Black Sea, and these allied powers announced to the Czar Nicholas that their combined fleets must have command of that sea. A treaty of alliance between France, England, and the Porte having been signed Mar. 12, the former two powers declared war Mar. 27 and 28. The French and English fleets bombarded Odessa Apr. 22. Lord Raglan took command of the British army, and Marshal Saint-Arnaud of the French. The allied armies landed at Varna May 29, and there suffered severely from cholera. The allies moved their armies to the Crimea early in September, and defeated the Russians at the river Alma on the 20th of that month. Prince Mentchikof commanded the Russian army. The allies commenced the bombardment of Sevastopol Oct. 17, fought a battle at Balaklava Oct. 25, and gained a victory at Inkerman Nov. 5. The British troops, being ill supplied with food and clothing, suffered great privations and hardships in the ensuing winter, and large numbers of them perished. The King of Sardinia joined the allies in Jan., 1855. In May Gen. Pélissier became commander-in-chief of the French army. On June 18 the allies attacked the important fortresses known as the Malakoff and the Redan, but were repulsed. The French took the Malakoff by storm Sept. 8, 1855, and the Russians evacuated Sevastopol about the 9th of that month. An armistice was concluded Feb. 26, 1856, and a treaty of peace was signed in Paris Mar. 30, 1856. See Kinglake, *The Invasion of the Crimea* (8 vols., 1863–87). See Sevastopol.

Criminal Law: See Law and Crime.

Criminology: See the Appendix.

Crimmitschau, krim'mit-show: a town of Saxony; on the Pleisse and on the railway from Altenburg to Zwickau; 10 miles N. W. of the latter (see map of German Empire, ref. 5–F). It has manufactures of woolens and a number of machine-works and breweries. Pop. (1895) 23,553.

Crinoi'dea [from Gr. *κρίνον*, lily + *εἶδος*, appearance]: a class of *Echinodermata*, characterized by having a spherical or cup-shaped body, from which radiate five (often branching) arms, which in turn may bear small processes or pinnulæ. The central body is attached to some submarine object either directly or by the intervention of a long, many-jointed stalk. In most genera this attachment continues throughout life, but in the genus *Comatula* the body soon separates from the stalk, and afterward pursues a free existence. The mouth is in the center of the surface opposite the stalk, and the vent is at one side. In the typical forms ciliated grooves radiate from the mouth and extend along the arms. The cilia in these grooves create currents in the water which bring food to the mouth. The body externally is enveloped in calcareous plates, the arrangement of which is of value in classification, and the stalk is made up of a series of calcareous disks like button molds movably united one with another. The joints of the stem are extremely abundant as fossils, and in England have the common name of "St. Cuthbert's beads." The Crinoids are divided into three groups—the Crinoids proper, the Blastoidea, and the Cystidea. The Crinoids proper range from the Silurian rocks to the present time. In the Carboniferous age they were extremely abundant, and beautiful collections have been made at Crawfordsville, Ind., and Burlington, Ia. Of the recent forms the species of Comatula are numerous, but the other forms are rare, and until the last twenty-five years only one species was known, *Pentacrinus caput-medusæ* from the West Indies. Now a number of species are known. The Blastoids and Cystideans are all extinct; they appear in the Silurian and die out in the Carboniferous rocks. The Blastoids are acorn-shaped and lack arms; the Cystideans have weak arms, and are attached either directly or by the intervention of a short stalk.

J. S. Kingsley.

Crinoline [Fr., hair-cloth; deriv. of *crin*, horse-hair < Lat. *crinis*, hair]: literally, *hair-cloth*; in general, any very stiff textile material intended to stiffen articles of dress or parts of them by being put in as a lining or interlining. Especially, such a stuff when used as an underskirt in women's dress, as in the styles from 1840 to 1865. By extension, a stiff underskirt of any material, even the skeleton of wire and flat steel springs, more properly called a hoop-skirt; and also such skirts in general, as in the phrase "Crinoline is in fashion." The material seems to have been known by this name as early as 1830, but the skirt expanded to great size by its use is not earlier than 1848.

Cripple Creek: mining town; El Paso co., Col. (for location of county, see map of Colorado, ref. 4–E); situated among the hills at the base of Pike's Peak; 30 miles W. by S. of Colorado Springs; connected with the Colorado Midland R. R. by a branch railway 24 miles in length. The town owes its existence to the discovery of gold here in 1891. Pop. (1893) with adjacent mining camps about 3,000; (1900) 10,147. In Apr., 1896, the town was almost wiped out by incendiary fires.

Crisafulli, Henri: French dramatist; b. at Naples in 1827, but educated in Paris. In collaboration with Édouard Devicque he wrote several dramas, including *Cæsar Borgia* (1855) and *Giroflé-Girofla* (1858), and a comedy, *Ernest Ramel* (1861). These were followed by a great number of works written singly or in collaboration with others, among which are *Monsieur et Madame Fernel* (1864); *The Wolves and the Lambs* (1868); *The Postillions of Fougerolles* (1873); *Lord Harrington* (1879). In connection with Gustave Aimard he published a series of romances entitled *Les Invisibles de Paris* (5 vols., 1866–67).

Cri'sis [Gr. *κρίσις*, decision; deriv. of *κρίνειν*, decide]: in medicine, the sudden termination of disease. Certain diseases are prone to terminate by sudden improvement after a course of definite duration. This is notably true of pneumonia, typhus fever, relapsing fever, and a number of others. Among the older physicians "critical days" were regarded as significant of the alteration or elimination of the material cause of disease, and such days were looked forward to with apprehension or hopefulness, according to the progress of the patient's condition. Critical days in this sense did not necessarily imply termination of the disease, but rather days of profound change toward recovery. The crisis of disease is often preceded by aggravation of the morbid symptoms, while the crisis itself is attended with rapid subsidence of

the symptoms. On the other hand, because of this very suddenness, exhaustion, or collapse, and profuse discharges, as of sweat (critical discharges), are frequently observed.

Crisis, Commercial: See COMMERCIAL CRISES.

Crisp, CHARLES FREDERICK: U. S. politician; b. in Sheffield, England, Jan. 29, 1845. His parents, who were actors, brought him to the U. S. when he was a child; he received a common-school education in Savannah and Macon, Ga.; served during the civil war in the Confederate army, becoming a lieutenant in a Virginia regiment, and, in consequence of capture by Union forces, being confined as a prisoner of war in Fort Delaware; admitted to the bar in Americus, Ga., 1866; solicitor-general for the southern judicial district of Georgia; judge of the superior court 1877–82; elected as a Democrat to Congress 1882, and successively re-elected; elected Speaker of the Fifty-second Congress 1891, and of the Fifty-third 1893–95. D. Oct. 23, 1896.

Cris'pi, FRANCESCO: Italian statesman; b. Oct. 4, 1819, at Ribera, Sicily; became a lawyer in Naples; was in 1848 one of the leaders of the insurrection in Palermo, and for two years prominent among the Sicilians in their resistance to Ferdinand I. In 1859 and 1860 he was again at the head of the new revolution of Sicily, and co-operated with Garibaldi in the expulsion of the Bourbons, which brought about the annexation of Naples and Sicily to the kingdom of Italy. Elected member of the Parliament in 1861, he became leader of the Constitutional Left; president of the Chamber of Deputies 1876: 1877–78, and again in 1887, Minister of the Interior; president of the Council 1887–91, and again in 1894–96. He was a firm supporter of the triple alliance of Italy, Germany, and Austria. Revised by C. K. ADAMS.

Cris'pin, SAINT: a native of Rome; worked at the trade of a shoemaker in Gaul. In 287 A. D. he and his brother Crispian suffered martyrdom, and both are commemorated on St. Crispin's Day, Oct. 25. St. Crispin is the patron saint of shoemakers.

Cri'tias (in Gr. Κριτίας): Athenian orator and statesman; a pupil of Socrates. Banished from Athens about 406 B. C., he returned with Lysander in 404 and became one of the so-called Thirty Tyrants. He caused the death of Theramenes, and not long after perished himself in a battle with the men of Thrasybulus 404 B. C. He wrote political pamphlets, dramas, elegies. The few fragments of the elegies that remain are characteristic of his carping temper. See Bergk's *Poetæ Lyrici Græci*, ii., pp. 279–284 (3d ed.).

Critical Philosophy: See KANT.

Criticism: the act or the art of criticising. In the latter signification it has been defined as "the art of judging with propriety concerning any object or combination of objects." In a more limited meaning its province is confined to literature, philology, and the fine arts, and to subjects of antiquarian, scientific, and historical investigation. The elements of criticism depend on the two principles of beauty and truth, one of which is the final end or object of study in every one of its pursuits—beauty in letters and the arts, truth in history and the sciences. Thus historical criticism teaches us to distinguish the true from the false or the probable from the improbable in historical works; scientific criticism has the same object with respect to the different branches of science; while literary criticism, in a general sense, has for its principal employment the investigation of the merits and demerits of design, style, or diction, according to the general principles of composition and to the received standard of excellence in every language. In poetry and the arts, criticism develops the principles of that more refined and exquisite sense of beauty which forms the ideal model of perfection in each.

Of all the critics of antiquity, the greatest beyond comparison was undoubtedly Aristotle. Aristarchus, who is often styled "the prince of critics," was more properly a grammarian and commentator than a critic, in the wider modern acceptation of this term. Among the Romans Quintilian was especially distinguished as a critic, but the poet Horace was a critic of a higher and rarer order.

In modern times the greatest names in general criticism among the English are those of Dryden, Pope, Dr. Johnson, S. T. Coleridge, Hazlitt, Mackintosh, and Hallam; to which may be added those of Lords Jeffrey, Brougham, and Macaulay; and, lastly, that of Carlyle, who, if too often extravagant and wayward, is perhaps, when not biased by pique or prejudice, not surpassed by any in breadth of comprehension or truth of insight. In the U. S. Ralph Waldo Emerson, James Russell Lowell, George Ripley, Edwin Percy Whipple, Henry James, Jr., and others, have distinguished themselves in this branch of literature. Among the French the most celebrated names are those of Boileau, Voltaire, Villemain, Sainte-Beuve, and Taine. The literature of Germany is rich in illustrious critics. Among the greatest of these, in the department of general criticism, are Lessing, Goethe, and the two Schlegels. It is proper to observe that the Germans have studied the great principles which lie at the base of all sound criticism—i. e. the art or science of judging—more philosophically and more thoroughly than the critics of other nations. But it is perhaps in particular criticism that the Germans are most distinguished. Among the most remarkable examples of this kind we may cite Kant in the department of philosophy, Winckelmann in art, and Niebuhr in history, besides a host of other less distinguished names.

Criticism, the Higher (biblical): See HIGHER CRITICISM.

Cri'to, or **Cri'ton** (in Gr. Κρίτων): Greek philosopher; a citizen of Athens, and a friend and disciple of Socrates, whom he attended in his last hours. He wrote seventeen dialogues on philosophy, which are not extant. Plato gave the name of "Crito" to one of his books.

Critola'us (in Gr. Κριτόλαος): Greek philosopher; b. at Phaselis, in Lycia. He was the head of the Peripatetic school in Athens, and was eminent as an orator as well as a philosopher. He was sent to Rome on an important embassy with Carneades about 155 B. C.

Crittenden, GEORGE BIBB: general; son of John Jordan Crittenden; b. at Russellville, Ky., Mar. 20, 1814; graduated at West Point 1832; began to practice law in Kentucky in 1835; served with distinction in the Mexican war; resigned his commission of lieutenant-colonel in the U. S. army in 1861, and joined the Confederate army. He became a major-general: defeated at Mill Spring, Ky., Jan. 19, 1862; was censured for his conduct on that occasion and was kept in arrest by the Confederates till Nov., 1863, and soon after resigned, but continued to serve in the army as a volunteer. D. at Frankfort, Ky., Nov. 27, 1880.

Crittenden, JOHN JORDAN: statesman; b. in Woodford co., Ky., Sept. 10, 1787. He graduated at William and Mary College in 1807, and studied law; removed to Tennessee; in 1809 was appointed attorney-general of the Territory of Illinois; served as a volunteer in the war of 1812; returned to the practice of the law, attaining distinction; and was elected to the Senate of the U. S. for a short term in 1816. In 1819 he removed to Frankfort, Ky.; from 1827 to 1829 was U. S. district attorney, and in 1835 was re-elected to the national Senate by the Whigs for a term of six years. He was a personal and political friend of Henry Clay. In Mar., 1841, he was appointed Attorney-General of the U. S., but he resigned in September of that year. He was again elected a Senator of the U. S. in 1843, and was chosen Governor of Kentucky in 1848. He was Attorney-General in the cabinet of President Fillmore from July, 1850, to Mar., 1853, soon after which he joined the Native American party. In 1855 he again became a U. S. Senator. He opposed the secession movement in 1860–61, and, performing the part of a mediator, offered in the Senate a series of resolutions called the "Crittenden Compromise," which were not adopted. On the other hand, he opposed the employment of slaves as soldiers, and denounced the conscription bill. He was noted for his eloquence. D. near Frankfort, Ky., July 26, 1863.

Crittenden, THOMAS LEONIDAS: general; a son of John Jordan Crittenden; b. at Russellville, Ky., May 15, 1815; State attorney in Kentucky 1842. He served with honor in the Mexican war. He commanded a division of the Union army at Shiloh, Apr., 1862, and obtained the rank of major-general of volunteers in the summer of that year. He commanded a corps at the battle of Stone River in 1863. Colonel of infantry 1864. Retired May, 1881. D. Oct. 23, 1893.

Crivelli, CARLO: painter; b. in Venice about 1435; studied under Antonio and Bartolommeo da Murano. When he became famous he was commissioned to work in different parts of Italy, so that few of his paintings remain in Venice. He lived chiefly in the Marches, where his works may be seen in great numbers, as at Massa, Ascoli, and Ancona. Nothing is known of him after 1493.

Croa'tia: a province of the Austro-Hungarian monarchy; is bounded on the N. W. by Carniola and Styria, on the W. by the Adriatic Sea, on the N. E. by Hungary, and on the S. by Bosnia, Servia, and Dalmatia. Various out-

runners of the Alps, generally comprised under the common name of "the Julian Alps," traverse the country in its whole length, and divide it into two distinct sections, one belonging to the basin of the Danube, watered by the Save and the Drave, and the other forming part of the highlands of the Adriatic coast. About 16 per cent. of the whole country is completely unproductive. In the eastern districts large tracts afford only pastures. But generally the mountains are covered with dense forests of oak, beech, pine, and chestnut trees, and the coast region, 88 miles long, as well as the valleys of the Save and the Drave, is very fertile. The coast regions are exposed to a violent wind, the so-called *bora*, and in the mountains the weather is subject to sudden changes. But in the valleys the climate is generally equable and mild. Large crops of wheat, oats, rye, potatoes, flax, and hemp are raised; tobacco is extensively cultivated, and an excellent wine is produced, though the national beverage, like that of Hungary, is made from the plum. Horses, swine (feeding in the forests), and bees are kept in great numbers. The manufacturing industry of the country is very small. A few silk-spinning factories, glass-works, and distilleries—that is about all. Grain, wine, chestnuts, honey, and horses are exported. Capital, Agram. Of the inhabitants, about 90 per cent. are Croats and Servians, the remainder are Germans, Magyars, Israelites, Italians, and Albanians. Croats and Servians are two Slavic tribes which speak the same language, though the former use the Latin and the latter the Cyrillic alphabet. About 71 per cent. of the population are Roman Catholics, 20 per cent. belong to the Oriental Greek Church; the remainder are Protestants and Jews. This region was anciently inhabited by the Pannonians, who were conquered by the Romans in the reign of Augustus. In 640 A. D. the Croatians or Horvats migrated from the Carpathian Mountains to this country, and gave it the name of Croatia. For several centuries Croatia was an independent kingdom, until in 1097 it was conquered by the King of Hungary. This province, with Slavonia and their former "military frontier," now forms a division of the Hungarian kingdom (*Transleithania*). Their united area is 16,772 sq. miles, of which 5,246 is Croatian. Pop. (1890) with Slavonia, 2,200,977.

Crockery: See POTTERY AND PORCELAIN.

Crockett: town: capital of Houston co., Tex. (for location of county, see map of Texas, ref. 3–J); situated on railway; 100 miles N. of Houston; has two large seminaries, public schools, and mercantile and agricultural industries. Pop. (1880) 599; (1890) 1,445; (1900) 2,612. EDITOR OF "COURIER."

Crockett, DAVID: hunter and humorist; b. at Limestone, Tenn., Aug. 17, 1786. He was elected a member of Congress in 1826, 1828, and 1832, and was a political friend of Gen. Jackson. His habits were eccentric. He enlisted in the Texan army in revolt against Mexico, was taken prisoner at Fort Alamo, and massacred Mar. 6, 1836. His *Autobiography* was published in Philadelphia (1834); also *Tour to the North and Down East* (1835); *Sketches and Eccentricities* (1847); *Exploits in Texas*, and *Life of Van Buren* (1835).

Crockett, Rev. SAMUEL R.: clergyman and author; b. at Duchrae, New Galloway, Scotland, in 1859; educated at the Free Church Institution at Castle Douglas, and at Edinburgh University; became minister of Penicuik 1887. Has published *The Stickit Minister* (1893); *The Raiders*; *Mad Sir Ughtred of the Hills*; *The Lilac Sunbonnet*; *The Men of the Moss Hags*; *Cleg Kelly*, etc.

Crocodile [from Gr. κροκόδειλος, etymol. unknown]: a reptile of the genus *Crocodilus*, which comprises the *true* crocodiles as distinguished from the alligators, caymans, and gavials. *Crocodilus* is the typical genus of the order *Crocodilia*, a group of reptiles characterized by an elongated body, short, stout limbs, and massive skull. The teeth are conical, implanted in sockets, and are replaced as fast as they wear out by others developed at their bases. The jaw is extended backward some distance beyond its articulation with the skull, so that the cranium appears to move on the jaw. The arrangement is such that by elevating the muzzle crocodiles can readily open their mouths while lying flat upon the sand. Cartilaginous processes are attached to the hinder margin of the ribs similar to the bony uncinate processes so characteristic of birds, and a series of splint-like bones is found along the under side of the abdomen from the breast bone to the pelvis. The ears, eyes, and nostrils are closed by flaps or valves, and the disposition of these organs is such that the animals of this order can see, hear, and smell without exposing more than the tip of the nose and that part of the skull immediately about the eye. The heart has four complete divisions, but the aortic arches communicate so that venous and arterial blood are mingled in the circulation. The back and neck always, and the under side in some genera, are protected by bony dermal plates. The tongue is attached all around to the mouth, and the nostrils open at the back of the mouth behind a flap (formed by a modification of the hyoid) which prevents water from entering the throat when the mouth is opened under water. Crocodiles deposit their eggs in the sand or mud, to be hatched by the heat of the sun, or bury them in a heap of decaying vegetation. In the latter case the female jealously guards the nest, not only from outside intruders but from the male, who would otherwise devour the young. The crocodilia are found in fresh or brackish waters throughout the greater portion of the warmer parts of the globe. In localities where the winter temperature is cool these reptiles bury themselves in the mud and hibernate; in tropical countries, where a dry season prevails, they bury themselves and æstivate.

Living *Crocodilia* are divided into three families: (1) GAVIALIDÆ, containing the gavial of India and tomistoma of Borneo, distinguished by a long, narrow muzzle, the two halves of the lower jaw being in contact for upward of half their length, and teeth of nearly equal size interlocking with one another. (2) CROCODILIDÆ, the true crocodiles, with rather long muzzle, but the halves of the jaw only meeting for a short distance at the front end. Teeth of various sizes, interlocking, the first lower tooth fitting into a pit in the upper jaw, the fourth in a notch. Hind legs deeply fringed, toes much webbed, no bony bar between the nostrils. Widely distributed. (3) ALLIGATORIDÆ, alligators and caymans, characterized by a broad muzzle, lower teeth fitting within the upper, fourth lower tooth in a pit, not showing in closed mouth. A bony bar between the nostrils. Toes slightly webbed, no fringe on hind legs. One species of alligator is confined to North America, a second occurs in China. The caymans are confined to Central and South America. The true crocodiles have their habitat in Southern Asia, and have a preference for slow-running or still waters, where they feed upon fish and the partly decomposed bodies of animals they may capture or find dead. Their seeming preference for putrid flesh is largely a matter of necessity, for the broad jaws and conical teeth of these reptiles are ill adapted for cutting flesh, while their ability to swallow is limited by the unyielding articulations of the jaws and tough hide upon the throat. Consequently, prey above a given size must be kept until soft enough to be torn. Crocodiles swim well, the chief organ of propulsion being the powerful tail, the fore legs being tucked up beside the body. On land they ordinarily walk with the body almost touching the ground, but on rare occasions, when at bay or in a great hurry, they stand almost upright, supported by the hind legs and tail. In spite of their size and ugly appearance, crocodiles, with exceptions to be noted hereafter, do not often attack men. Probably, like other animals, they differ in disposition in different localities, something depending on the abundance of food. Their size is usually greatly overestimated, for they rarely exceed a length of 12 feet, although now and then one is taken 18 or even 20 feet long. Out of 266 specimens of the salt-water crocodile taken in Sarawak, Borneo, in one year, only three exceeded a length of 13 feet, the largest being 13 ft. 10 in. The crocodile of the Nile, *Crocodilus*

Nilotic crocodile.

niloticus, revered by the ancient Egyptians and mummied when dead, is now so persecuted by tourists that it has almost disappeared below the First Cataract, and has in other places become exceedingly wary. It is, however, still widely distributed in Africa, and in some localities is so dangerous that the natives are obliged to build inclosures of stout posts, reaching into the rivers, in order to draw water with safety. Other African crocodiles are *Crocodilus cataphractus*, with a long, thin muzzle, and the black crocodile, *C. niger*, with a short head, both from the western part of the continent. The muggar, or marsh crocodile (*Crocodilus palustris*), is abundant in various parts of Southern Asia, and in some localities of India is still held in some reverence, and fed and protected by its fakir friends. It ranges from the hot swamps of the seacoast to the snow-fed streams of the Himalayan valleys. The salt-water crocodile (*Crocodilus porosus*) occurs from India to Northeast Australia, being especially abundant in some portions of the Malay Peninsula and Borneo. It is partial to the estuaries of rivers, and not infrequently ventures out to sea for a mile or so. This animal has an exceedingly massive head, reaches a great size, and is so much dreaded from its man-eating propensities that in some places a price of so much per foot is paid for its capture.

Three species of crocodiles occur in the West Indies and South America, one of which, *Crocodilus americanus*, is found sparingly in Southern Florida. See Alligator, Cayman, and Gavial. F. A. Lucas.

Crocodile Bird or **Crocodile Watcher**: a small species of plover (*Pluvianus ægyptius*); found in Northern and Western Africa, and rarely on the northern shores of the Mediterranean. So named from its habit of feeding around or upon the crocodiles as they bask in the sun. It even ventures to pick the leeches (*Bdella nilotica*) from the very mouths of these huge reptiles, a fact noted by Herodotus and confirmed by Brehm. It is called zic-zac, from its note. F. A. Lucas.

Crocodilopolis: a city of Ancient Egypt (*q. v.*).

Crocus [Gr. *κρόκος*, crocus, saffron]: a large genus of iridaceous plants (herbs) natives of Asia and Europe. The *Crocus vernus* and other species are well known as affording many varieties of very early spring flowers, which are common in cultivation. *Crocus sativus* and other species blossom in autumn. The autumn crocuses are rarely cultivated in the U. S. Their orange-red stigmas, when dried, constitute the drug known as "true" Saffron (*q. v.*).

Crocus of Mars: the finely divided red oxide of iron used in medicine and in the arts. The "crocus of antimony" of the old chemists was a mixture of the tersulphide and teroxide of antimony. The "crocuses" received their name from their saffron color.

Croes, John James Robertson: See Appendix.

Croes, John, S. T. D.: first bishop of the P. E. Church in New Jersey; b. at Elizabethtown, N. J., July 1, 1762; served in the Continental army from 1778 to the close of the war for independence; ordained by Bishop White, Feb. 28, 1790, taking charge of Trinity church, Swedesborough, N. J.; became rector of Christ church, New Brunswick, N. J., in May, 1801, where the rest of his life was spent. At the request of the trustees of Queen's College, then practically defunct, he opened a classical school in the college building, which soon became widely known, and prospered under his direction for several years. In 1825 this school became Rutgers College. The honorary degree of S. T. D. was conferred upon him by Columbia College in 1811. In June, 1815, Dr. Croes was elected Bishop of Connecticut, to succeed Bishop Jarvis. The diocese of New Jersey, to retain his services, on Aug. 15, 1815, elected him its bishop. He accepted the latter position, and was consecrated by Bishop White, assisted by Bishops Hobart and Kemp, on Nov. 19, 1815. D. in New Brunswick, N. J., July 30, 1832.

Cræ'sus (in Gr. Κροῖσος): a king of Lydia proverbial for his riches; was born about 590 B. C. He succeeded his father, Alyattes, in 560, and soon extended his dominions by the conquest of the Æolians, Ionians, and other peoples of Asia Minor. Sardis was the capital of his kingdom. He is said to have enriched himself by the golden sand of Pactolus. In 546 B. C. he was defeated in battle and taken prisoner by Cyrus of Persia, who devoted him, together with fourteen Lydian youths, to the flames as a thanksgiving sacrifice to the god whom the Persians worshiped under the aspect of the fire. Crœsus was saved, however, in a curious way, and afterward lived in honor at the court of Cyrus as his trusted friend. See Herodotus's beautiful narrative.

Croffut, William Augustus, Ph. D.: editor and author; b. in Redding, Conn., Jan. 29, 1836. He received an academic education; taught a public school for a time; served in the civil war as soldier and correspondent, and afterward had editorial charge successively of the New Haven (Conn.) *Palladium*, Rochester (N. Y.) *Democrat*, St. Paul (Minn.) *Times*, Minneapolis *Tribune*, Chicago *Evening Post*, and Washington *Post*, and was an editorial writer on the New York *Graphic*, New York *Tribune*, and New York *World*. He has thrice visited Europe, and has also traveled through Mexico, Yucatan, Cuba, Nova Scotia, the Bermudas, Egypt, Arabia, and Palestine, and has been a voluminous writer of syndicate letters to newspapers. He was executive officer of the U. S. geological survey from 1888 to 1891, when he took charge of the editorial division of that bureau. He is the author of *The War History of Connecticut* (New York, 1867); *A Helping Hand* (Cincinnati, 1868); *Bourbon Ballads* (New York, 1880); *Deseret*, an opera, music by Dudley Buck (1881); *A Midsummer Lark* (1882); *The Vanderbilts* (1886); *Folks Next Door* (1892); *The Prophecy and other Poems*, a second volume of poems (1893); also of a poem read at the opening of the Columbian Exposition at Chicago (May 1, 1893). He has received the degree of Ph. D. from Union College.—His wife, Bessie B. Croffut, has published several stories and contributed extensively to encyclopædias.

Croft, William: composer of cathedral music; b. in Warwickshire in 1677. He was appointed composer to the chapel-royal and organist of Westminster Abbey in 1708. He composed *Divine Harmony* (1712) and *Musica Sacra* (1724). D. Aug. 14, 1727.

Crofters: in Scotland, tenants who reside on holdings the annual rent of each of which does not exceed £30. The term commonly designates a small tenant of land who lives mainly by farming or the raising of live stock. There are two classes: First, those who occupy land in separate tenancy only; and second, those who occupy tillable land in separate tenancy and hold mountain pastures in joint tenancy. The first class are sometimes called "independent" crofters and the second "township" crofters. The latter are so much the more numerous that the joint tenancy of pasture is the characteristic feature of the crofting life. They are found in the lower parts of the Western Highlands and islands, Sutherland, Caithness, Orkney, Shetland, and in parts of Ross-shire and Inverness-shire, and less frequently on the eastern seaboard. In their local government and in the possession of common rights and common obligations they preserve many features of the primitive community. The system is a partial survival of the custom of land tenure that was once common in all Scotland and in many other countries. The crofters generally derive a part of their support from employment outside of the labor on the land. The cottars are closely related to the crofters in origin and pursuits, but they are lower in the economic scale, being frequently mere squatters. The cottars are found mingled with their more fortunate neighbors, the crofters, throughout the crofting country. Both of these classes have had special grievances, which led to the appointment by the House of Commons in 1883 of a royal commission to investigate their condition. It was not, however, until 1886 that the Crofters' Holdings Act received the sanction of Parliament and the crown. The numerous wise provisions of this act have not resulted in much improvement, owing to unfavorable conditions. The crofter and cottar population is computed in round numbers at about 200,000.

C. H. Thurber.

Crofts, Ernest: English genre and military painter; b. in Leeds, Sept. 15, 1847; pupil of A. B. Clay, London, and Hunten, Düsseldorf; associate Royal Academy, London; third-class medal, Paris Exposition, 1889, for his picture, *Marlborough—after the Battle of Ramillies*. Studio in London. W. A. C.

Croghan, George: an inspector-general of the U. S. army; b. near Louisville, Ky., Nov. 15, 1791; served as volunteer aide in the battle of Tippecanoe 1811; appointed captain in the Seventeenth Infantry 1812; major 1813; lieutenant-colonel 1814; and inspector-general, with the rank of colonel, 1825. He distinguished himself at the defense of Fort Meigs and sortie May 15, 1813, and for his gallant conduct in the defense of Fort Stephenson, against a greatly superior force of British and Indians, he was presented by

Congress with a gold medal with suitable emblems and devices. D. in New Orleans, Jan. 8, 1849.

Croix, Carlos Francisco, Marques de: Spanish general and administrator; b. at Lille, in Flanders, 1699. He served for fifty years in the army, attaining the rank of captain-general (1770); was a knight commander of Calatrava, successively commandant at Ceuta and Puerto de Santa Maria, and captain-general of Galicia. He was Viceroy of New Spain (Mexico) from Aug. 25, 1766, to Sept. 22, 1771. His administration was one of the best that Mexico ever had, and he was greatly esteemed as a pure and upright man and an excellent soldier. After his return to Spain he was viceroy and captain-general of Valencia until his death in 1786.
Herbert H. Smith.

Croix, Teodoro, de: Spanish knight; b. at Lille, in Flanders, about 1730. He accompanied his brother, the Viceroy Carlos Francisco de Croix, to Mexico in 1766, and was commandant of the interior provinces and of Sonora. From Apr., 1784, until Mar., 1790, he was Viceroy of Peru. He instituted numerous reforms in the treatment of the Indians, and his rule throughout was tranquil and prosperous. He returned to Spain by way of Cape Horn. D. in Madrid, Apr. 8, 1791. Herbert H. Smith.

Cro'ker, John Wilson: writer and politician; b. in Galway, Ireland, Dec. 20, 1780. He was elected a Tory member of Parliament in 1807; and was secretary of the Admiralty from 1809 to 1830. He co-operated with Scott and others in founding the *Quarterly Review*, to which he contributed 260 articles, including many roughly satirical reviews. In Parliament he obstinately opposed the Reform Bill, and on its passage refused to re-enter Parliament. Among his works, which number seventeen, are *Songs of Trafalgar* and an edition of Boswell's *Life of Johnson* (1831). He is the "Rigby" of Disraeli's *Coningsby*. D. Aug. 10, 1857. See his *Memoirs* (1884).

Croker, Richard: U. S. politician; b. in Black Rock, Ireland, Nov. 24, 1843. His grandfather, Maj. Henry Croker, was inspector-general in the British army, one of his uncles was a member of Parliament, and another was a captain in the British army and a governor of Bermuda. He accompanied his father to the U. S. when three years of age, and has since resided in New York city. He served in Gen. Sickles's brigade during the civil war, and also in the Tenth New York Engineers; elected in 1867 alderman of New York; re-elected in 1869; again elected alderman in 1883; the same year (Nov. 16) was appointed fire commissioner; in 1889–90 was city chamberlain. He early attracted the attention of John Kelly, was prominent in opposition to the Tweed ring, and rapidly advanced in power in the Tammany Hall organization, of which he has been for some years the head. C. H. T.

Croker, Thomas Crofton: Irish writer; b. at Cork, Jan. 15, 1798. He obtained a clerkship in the Admiralty at the age of twenty-one, and retained that position until 1850. He published *Researches in the South of Ireland*; *Fairy Legends and Traditions* (6th ed. 1882); *Legends of the Lakes*, etc. D. Aug. 8, 1854.

Croll, James, LL. D., F. R. S.: geologist and philosopher; b. in Whitefield, Perthshire, Scotland, 1821; for many years connected with the official geological survey of Scotland. His first contribution to literature was in the domain of philosophy, and shortly before his death he published a work on *The Philosophic Basis of Evolution*; but the energies of his life were chiefly devoted to studies in geologic physics, which were embodied in many essays and gathered in three treatises: *On the Physical Characters of the Change of Climate during the Glacial Epoch* (1864); *Climate and Time in their Geological Relations* (1875); *Climate and Cosmology* (1886). The first of these works embodied an elaborate theory of Pleistocene changes of climate, ascribing them to variations in the distribution of solar heat upon the earth occasioned by the precession of the equinoxes and secular changes in the eccentricity of the earth's orbit. This theory immediately received great attention, and has been the subject in subsequent years of much discussion, pro and con. It has had a profound influence upon geologic thought and investigation, and is probably more widely used as a working hypothesis than any rival theory. D. at Perth, Scotland, Dec. 15, 1890. G. K. G.

Cro'ly, David Goodman: journalist; b. in New York city, Nov. 3, 1829; learned the trade of silversmith; was for a time a student in New York University; taught phonography; was employed on the *Evening Post* and New York *Herald* from 1854 to 1858; was editor and proprietor of the Rockford *Daily News*; was the first city editor on the New York *World*, and subsequently its managing editor; resigned in 1871, and from 1872 to 1878 was managing editor of the *Graphic*, an illustrated newspaper. He wrote a *Life* of Horatio Seymour, a *History of Reconstruction* (1868), and was the author of a brochure entitled *The Positivist's Primer* (1876); issued two numbers of the *Modern Thinker*; was the first to introduce the subject of minority representation to the American public in the *Galaxy* in 1866; wrote on journalism in the magazines. In 1856 married the lady now known as "Jennie June." D. Apr. 29, 1889.

Croly, George: a poet, prose-writer, and pulpit orator; b. in Dublin, Ireland, in Aug., 1780. He took orders in the Anglican Church; in 1810 settled in London to devote himself to literary work; became, in 1835, rector of St. Stephen's, Wallbrook, London. Among his works are *Salathiel, a Story of the Past, Present, and Future* (1827); *History of George IV.* (1830); *Poetical Works* (2 vols. 1830); *Catiline, a Tragedy*; a *Life of Edmund Burke* (1840); and *Marston*, a novel. D. Nov. 24, 1860.

Croly, Jane (*Cunningham*): better known as "Jennie June"; b. in Market Harborough, Leicestershire, England, Dec. 19, 1831; at an early age accompanied her parents to the U. S., and in 1856 married David G. Croly, of New York. She began her literary career as a contributor to daily, weekly, and monthly periodicals, her first published article appearing in the New York *Tribune*. She was a regular contributor to the New York *World* for thirteen years, to the New York daily *Times*, Noah's *Sunday Times* and the *Messenger* for ten years, and the weekly correspondent of the New Orleans *Detta*, Baltimore *American*, and other papers. She has besides published several books, *For Better or Worse*, *Talks on Women's Topics*, a cookery book, *Thrown on Her Own Resources*, three manuals, and a *History of Sorosis*. She inaugurated the system of duplicate correspondence, and was connected editorially with Demorest's *Illustrated Monthly* from its start, in 1860, for twenty-seven years. Mrs. Croly called the first woman's congress in New York, 1856, and also the second, 1869, and in 1868 inaugurated the Sorosis (see Clubs for Women). She founded the *Cycle*, a club organ and literary review, and became editor of the *Cycle* and also of the *Home-Maker* magazine. In 1892 she received the degree of Doctor of Literature from Rutgers Women's College, and was appointed to a new chair of journalism and literature in that institution. She has been since its start the president of the New York Women's Press Club, which she founded in 1889.

Crom'arty: county of Scotland politically connected with Ross (*q. v.*), comprising ten detached districts within the limits of that county. Area, 369 sq. miles.

Cromarty: town and seaport of Scotland; in the united counties of Ross and Cromarty; finely situated at the entrance of Cromarty Firth: 18 miles N. N. E. of Inverness (see map of Scotland, ref. 6–G). It has a good harbor, which will admit vessels of 400 tons; also manufactures of ropes, sailcloth, and sacking. Hugh Miller was born here. Pop. 1,300.

Cromarty Firth: one of the finest harbors on the east coast of Scotland. It communicates with Moray Firth, and is adjacent to the counties of Ross and Cromarty. It is sheltered at its entrance, which is 1½ miles wide, by two rocky hills called the Soutars. Its length is 18 miles, and its breadth varies from 3 to 5 miles.

Cro'mer: small seaport and watering-place of England, in Norfolk; on the North Sea; 21 miles N. of Norwich (see map of England, ref. 8–L). It stands on the top of a high cliff. It has a fine church in the Tudor style and a public library. All attempts to form a harbor for large craft here have been baffled by the heavy sea, which is continually encroaching on the land.

Cromlech, krom'lek: a circle of upright stones, erected by some forgotten race, such as are found in Brittany, Great Britain (see Stonehenge), Ireland, and Scandinavia. Formerly this name was applied by British archæologists to equally ancient structures consisting of two or more unhewn stones fixed vertically in the ground and supporting a large flat stone. These now bear the separate name of Dolmen (*q. v.*), and are believed to be uncovered chambered cairns. See Cairn.

Cromp'ton, Samuel: inventor of the spinning-mule; b. near Bolton, Lancashire, England, Dec. 3, 1753. Farming and weaving were the employments of his boyhood. For his invention, which was perfected in 1779, he received, in subscriptions from the manufacturers, only £67 6*s*. 6*d*. His means were so limited that he could not go to the expense of taking out a patent, and he was consequently glad to make private arrangements with the manufacturers for the use of his invention, many of whom, however, did not scruple to evade their obligation. Meanwhile, the mule spread so rapidly, and its influence was so palpable, that in 1812 he drew up a petition to Parliament for a public reward. Parliament voted him £5,000. He was a shy, sensitive, studious man, fond of mathematics and of music. But his business talent was very limited; he once more failed, and a new petition to Parliament was refused. D. at Bolton, June 26, 1827. See French, *Life of Crompton* (1860).

Cromwell, Henry: a younger son of Oliver; b. in Huntingdon Jan. 20, 1628. He served as colonel under his father in Ireland in 1649, became a member of Parliament in 1653, and lord deputy of Ireland in 1657. His administration was moderate and popular. After 1659 he lived as a private citizen. D. Mar. 23, 1673.

Cromwell, Oliver: Lord Protector of England; b. in Huntingdon, Huntingdonshire, Apr. 25, 1599. In 1616 he entered Sidney Sussex College, Cambridge, which he quitted on the death of his father in June, 1617. He married Elizabeth Bourchier in 1620, and settled on his estate at Huntingdon. In the Short Parliament of 1628 he made but one speech, and during the eleven years' prorogation he devoted his time to the cultivation of his farms. He represented Cambridge in the Short Parliament, which met in Apr., 1640, and in the Long Parliament, which met the same year. He was then a zealous member of the Country party, and took an active part in the business of the House. Having raised two companies of volunteers, he entered the army of Parliament in 1642 as a captain of cavalry, and distinguished himself by his strict discipline. He was soon promoted to be colonel. On July 2, 1644, he commanded the victorious left wing at Marston Moor. The Parliamentarians were divided into two parties, Presbyterian and Independent, of which latter Cromwell was the master-spirit. He was excepted from the "Self-Denying Ordinance," which excluded from military command members of Parliament. When the army was reorganized, and Fairfax appointed general-in-chief, Cromwell was promoted to the rank of lieutenant-general. In command of the right wing at Naseby, June, 1645, he greatly contributed to that decisive victory. In May, 1646, the king surrendered himself to the Scottish army, which transferred him to the custody of the English Parliament, in which the Presbyterians had a majority. In June, 1647, the king was seized by one of Cromwell's officers, and removed from the custody of Parliament into that of the army, which the Independents controlled. Charles hoped to profit by the dissensions between the Presbyterians and the Independents, and intrigued with both. Cromwell defeated the Duke of Hamilton, who commanded an army of Scottish royalists, at the battle of Preston, Aug., 1648. In December of that year forty-one Presbyterian royalists were ejected from Parliament by what was called "Pride's Purge." Cromwell was a member of the court which tried the king and condemned him to death in Jan., 1649. Cromwell was now the most powerful man in the country, and became a member of the new council of state. In 1649 he went to Ireland as lord-lieutenant with an army, and subdued the rebellious Irish royalists with extreme severity. The Scotch proclaimed Charles II. as their king, and raised an army for the invasion of England and the promotion of the royal cause. Cromwell, who had returned to England in May, 1650, was then appointed commander-in-chief. He signally defeated the Scottish army at Dunbar on Sept. 3, 1650, and took about 10,000 prisoners. Charles II., having been reenforced, marched into England, and was pursued by Cromwell, who gained a decisive victory at Worcester Sept. 3, 1651. In this great crisis he displayed eminent vigor and sagacity. Clarendon observes that "his parts seemed to be raised, as if he had concealed his faculties until he had occasion to use them." In Apr., 1653, he dissolved the remnant of the Long Parliament, which was called the Rump, and he soon summoned a new Parliament. He assumed the title of Lord Protector of the Commonwealth in 1653. His domestic policy was favorable to religious liberty and conducive to the prosperity of the country. His foreign policy was dignified and enlightened, and secured for England a more commanding position than she had previously occupied. The title of king was offered to him by Parliament, but he declined it. He was stigmatized as an usurper by the royalists, and also by the republicans. He died on Sept. 3, 1658, and was succeeded by his son Richard.

It was long the fashion for historians to represent Cromwell as a fanatic, a hypocrite, and a man of cruel temper and mediocre talents. His character was vindicated from these calumnies by Carlyle and other writers, and it is now generally admitted that as a statesman and commander he displayed abilities of the highest order. "Never," says Macaulay, "was any ruler so conspicuously born for sovereignty. The cup which has intoxicated almost all others sobered him. His spirit, restless from its buoyancy in a lower sphere, reposed in majestic placidity as soon as it had reached the level congenial to it. Rapidly as his fortunes grew, his mind expanded more rapidly still. Insignificant as a private citizen, he was a great general; he was a still greater prince."

Authorities.—Carlyle, *Letters and Speeches of Cromwell*; John Forster, *Life of Cromwell*, in his Statesmen of the Commonwealth of England (7 vols., 1840); Villemain, *Histoire de Cromwell* (1819); Guizot, *Life of Cromwell* (2 vols., 1851); Gardiner, *The Great Civil War* (3 vols., 1887–91).

Revised by C. K. Adams.

Cromwell, Richard: son of Oliver Cromwell; b. at Huntingdon, Oct. 4, 1626. He entered Lincoln's Inn as a student of law in 1647, and married Dorothy Major in 1649. He was a man of moderate capacity, virtuous and unambitious. After Oliver became Protector, Richard was elected to Parliament, and was a member of the Privy Council. He succeeded his father as Protector in Sept., 1658, but the army was disaffected, and he was not earnestly supported by the people. He resigned his power in Apr., 1659, and passed the rest of his life in obscurity and peace, spending about twenty years on the Continent. D. at Cheshunt, England, July 12, 1712.

Cromwell, Thomas: Earl of Essex; an English courtier and minister of state; b. at Putney about 1485, and bred to the law. His early life was spent on the Continent, where he successively served as a soldier, a merchant's clerk, and as a trader on his own account. He returned to England about 1513, and acquired wealth as a wool-stapler and scrivener. He became an agent of Cardinal Wolsey, who employed him in important business. Soon after the fall of Wolsey he entered the civil service of Henry VIII., whose favor he gained. He promoted the Reformation by his strenuous efforts to destroy the supremacy of the pope, and co-operated with his friend Cranmer in establishing a new ecclesiastical polity. In 1534 he was appointed principal secretary of state, and in 1535 vicar-general with power to suppress monasteries. He was for several years the most powerful subject in England, and was created Earl of Essex in 1540. He was a man of superior talents, but is said to have been unscrupulous and rapacious. Froude, however, defends him against these imputations, and gives him a high character. He promoted the marriage of Henry VIII. with Anne of Cleves, because she favored the Lutheran doctrines. His agency in this affair was conducive to his own ruin, for the capricious king regarded her with disgust. Cromwell was tried for treason, and was beheaded July 28, 1540. See Michael Drayton, *Historie of the Life and Death of Lord Cromwell* (1609); Froude, *History of England*, chaps. vi.-xvii.

Cronje, Piet: See Appendix.

Cro'nos (in Gr. Κρόνος): a god of the Greek mythology; was said to be a son of Uranus, and the father of Jupiter, Neptune, Juno, and Ceres. He is commonly identified with the Roman Saturn.

Cron'stadt [Germ., lit., crown city]: a fortified seaport-town of Russia; on the flat and arid island of Kotlin, in the Gulf of Finland; about 20 miles W. of St. Petersburg, and opposite the mouth of the river Neva (see map of Russia, ref. 5–C). It is an important commercial town, and the greatest naval station of Russia. It is stated that two-thirds of the foreign commerce of Russia passes through Cronstadt, which has three harbors. The outer harbor, which is intended for ships of war, is capable of containing thirty-five ships of the line. The inner harbor is used for merchant-vessels, and has a capacity for 1,000 vessels. The place is very strongly fortified. Pop. (1897) 59,539. Ice renders this port inaccessible for nearly five months in the year. See Ship-canals.

Cronstadt, in Transylvania: See KRONSTADT.

Crook, GEORGE: U. S. military officer; b. Sept. 8, 1828, near Dayton, O.; graduated at West Point in 1852; July 28, 1866, became lieutenant-colonel Twenty-third Infantry. He served on frontier 1852–61, in Rogue river expedition 1856, and in command of Pitt river expedition 1857; engaged in several actions, in one of which he was wounded with an arrow. In the civil war he became colonel Thirty-sixth Ohio Volunteers, and was promoted Oct. 21, 1864, to be major general U. S. volunteers, serving in West Virginia operations 1861–62, engaged at Lewisburg (wounded and brevet major); in Northern Virginia campaign 1862; in Maryland campaign 1862, engaged at South Mountain and Antietam (brevet lieutenant-colonel); in operations in West Virginia 1862–63; in Tennessee campaign 1863, engaged at Tullahoma, Hoover's Gap, Chickamauga, and pursuit of Wheeler, with constant skirmishes (brevet colonel); in Northern Virginia 1864, making constant raids and in numerous actions (brevet brigadier-general U. S. army and brevet major-general U. S. volunteers); in Sheridan's Shenandoah campaign 1864, engaged at Berryville, Fisher's Hill (brevet major-general U. S. army), Strasburg, Opequan, and Cedar Creek; in command of cavalry of Army of the Potomac 1865, engaged at Dinwiddie Court-house, Jettersville, Sailor's Creek, Farmville, and Appomattox Court-house; and in command of the district of Wilmington, N. C., 1865–66. In command of districts in Idaho 1866–68; of Department of Columbia 1868–70; of Department of Arizona 1871–75, and again in 1882; of Department of the Platte 1875–82. In 1873 was promoted to be a brigadier-general U. S. army; was major-general in 1888. D. Mar. 21, 1890.

Crooked Island: one of the Bahamas; area, 160 sq. miles (see map of West Indies, ref. 3–F). Exports salt.

Crooked (or Keuka) Lake: in the western part of New York; extends from Penn Yan southwestward into Steuben County, and is about 18 miles long. The greatest width is 1½ miles. The surface is 718 feet above the level of the sea.

Crookes, WILLIAM, F. R. S.: chemist and physicist; b. in London, 1832; educated in the Royal College of Chemistry; founded the *Chemical News* in 1859; editor of the *Journal of Science*, 1864; discovered thallium in 1861; has made numerous important discoveries in chemistry and physics; awarded a special gold medal by the Academy of Science in Paris, 1880; author of several handbooks and numerous contributions to scientific journals. In 1883 Crookes discovered some remarkable phenomena obtained by sending the electric discharge through glass tubes in which a very high vacuum had been produced. Hertz subsequently showed that certain of the rays emanating from such tubes were capable of penetrating metals and other opaque bodies. In 1896 RÖNTGEN (*q. v.*) utilized the property in photographing hidden objects. See GEISSLER'S TUBES.

Crookes Tubes: See GEISSLER'S TUBES.

Crooks, GEORGE RICHARD, D. D., LL. D.: Methodist divine and journalist; b. in Philadelphia, Feb. 3, 1822; graduated in 1840 at Dickinson College; joined the Methodist ministry in 1841; traveled and preached extensively in Illinois; was appointed classical and mathematical tutor in Dickinson College in 1842; principal of the Collegiate Grammar School in 1843; and adjunct Professor of Ancient Languages in 1846. In 1848 he resumed the ministry, occupying important pulpits in Philadelphia, Wilmington, New York, and Brooklyn. In conjunction with Prof. McClintock he prepared *A First Book in Latin* (1846) and *A First Book in Greek*, which have been successful text-books. He also published Butler's *Analogy* (1852), with an elaborate analysis of the work, notes, index, and life of Butler. His most important production is a *Latin-English Lexicon* for schools and colleges, the preparation of which was shared by Prof. Schem (Philadelphia, 1858). His eminent journalistic career began in 1860, when he was elected first editor of the *Methodist*, a weekly newspaper established in New York city by a company of Methodist laymen who were favorable to independent or unofficial journalism in their Church, and he was its editor till 1875. He was Professor of Historical Theology in Drew Theological Seminary from 1880 till his death. He published the *Life of Rev. Prof. Dr. John McClintock* (1876) and of *Bishop Matthew Simpson* (1890); *Sermons of Bishop Matthew Simpson, Edited from Shorthand Reports* (1885); and was joint editor of Crooks and Hurst's *Theological Encyclopædia and Methodology* (1884; n. e. 1893). D. at Madison, N. J., Feb. 20, 1897. Revised by J. F. HURST.

Crookston: city; capital of Polk co., Minn. (for location of county, see map of Minnesota, ref. 3–A); on Red Lake river; is a railway, commercial, and manufacturing center. It has central school building, costing $60,000, water-power, roller-mills, foundry, creamery, etc. Pop. (1880) 1,227; (1890) 3,457; (1900) 5,359. EDITOR OF "CHRONICLE."

Cropsey, JASPER FRANCIS: landscape-painter; b. in Rossville, N. Y., Feb. 18, 1823. He studied architecture for five years, and began to paint under Edward Maury, going to Europe in 1847; National Academician, 1851; member American Water-color Society. He exhibited frequently at the Royal Academy, London, and his style is somewhat like that of some English painters. His pictures are violently colored, but painted with a certain cleverness. Studio at Hastings, N. Y. D. June 22, 1900. W. A. C.

Croquet, krō-kā': an outdoor game much resembling that of pall-mall, which was popular in various parts of Europe in the sixteenth and seventeenth centuries. The game of croquet proper is comparatively modern. When first introduced into the U. S. it was considered a simple game, almost devoid of opportunities for the display of skill. With the development of the game, however, opportunities for accurate and scientific playing have been introduced, and the materials improved, until, as played by experts, the game is now claimed to be as scientific as billiards. The following description and rules apply to the game adopted by the National American Croquet Association (organized Oct. 4, 1882), which meets on the third Tuesday of August in each year at Norwich, Conn.

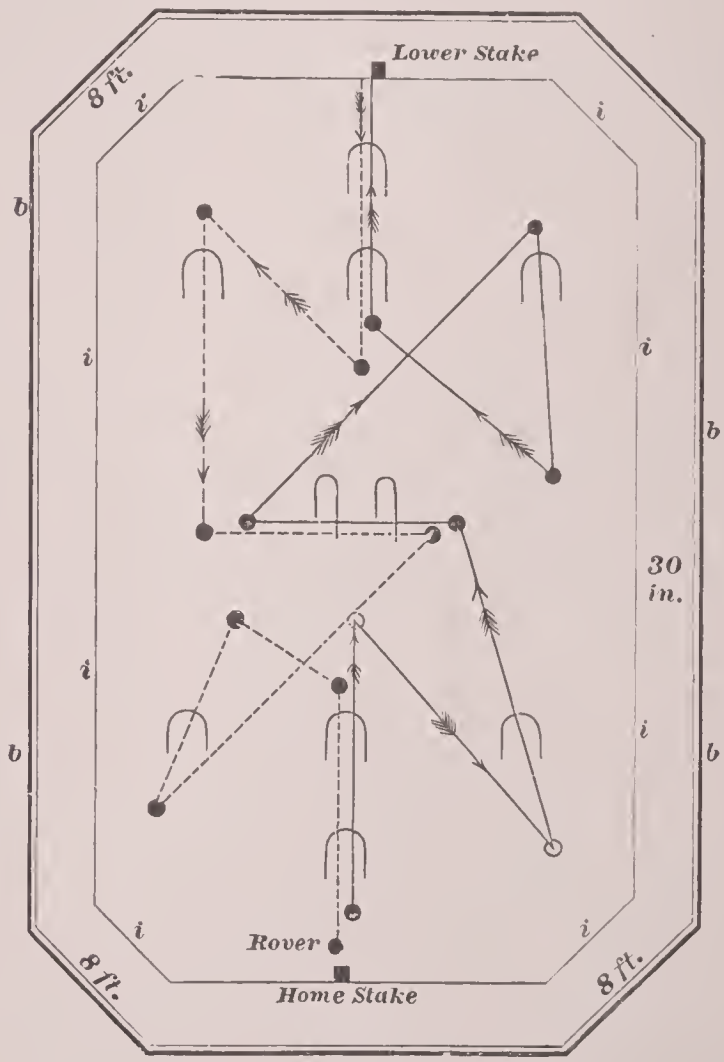


FIG. 1.

Grounds.—The ground when full-sized should measure 36 by 72 feet, and be raised 2 inches at the border, the slope extending 30 inches into the field as far as i i i, imaginary lines denoting the boundary of the field. (See Fig. 1.) The stakes or posts to be 1 inch in diameter and 1½ inches high, situated at the base of the rise at the center of the width of the field. The first wicket to be 7 feet from the stake; the second, 7 feet from the first, on a line extending through the middle of the field; the side arches to be 5 feet from the foot of the rise, on a line with the second arch from each stake; the cage or double wicket in the center to be 18 inches long and 3⅜ inches between the wires, and set at right angles with a line drawn from stake to stake. The border, b b b, at the top of the slope, to be made of maple or other hard

wood, about 4 by 6 inches, laid flat to serve as a cushion whence caroms can be made; the corner pieces to be of same material and 8 feet long, inside measurement. All arches, except the center arch, to be 3½ inches in the clear. The course of balls is indicated in the diagram. Many clubs still adhere to the old rectangular form, without any slope inside the border to bring the balls into the field, and with the wickets all made in the direction in which the player is going. In less scientific games the cage in the center is replaced by a single arch, which is made the same as the other arches. In the ordinary croquet set the wickets are very much wider than stated above. The game was originally and is still commonly played as a lawn game. Much more scientific play can, however, be made upon a ground of well-rolled dirt, lightly sanded to hold the balls. All national match games must be played on dirt ground. The mallets should be of boxwood, 7 or 7½ inches long by 2¼ to 2½ in diameter, and the handle from 8 to 30 inches long, to suit the player. The best balls are of hard rubber, 3¼ inches in diameter. Balls of boxwood and other hard wood are commonly used.

Terms.—Some of the commoner terms are: *Roquet*—to hit another ball with one's own ball; *croquet*—to place player's ball against roqueted ball and strike player's ball, moving both—called *loose croquet* or *roquet-croquet*, as distinguished from *tight croquet*, where the player's ball is held with the hand or foot, allowing only the roqueted ball to move; *carom*—rebounding from arch, stake, or border; *dead ball*—ball on which player has played since making a point; *set up*—same as in billiards, that is, leaving balls favorable for next shot; *wiring*—leaving balls so that following player has wire or stake between his ball and ball to be played upon; *object ball*—one at which player aims; *jump shot*—striking a ball with force on top just back of center so as to make it jump over any obstacle between it and ob-

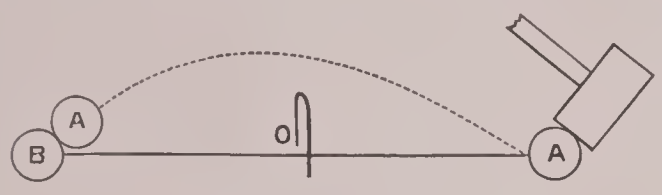


FIG. 2.—"Jump" shot.

ject aimed at; *guilty* or *danger* ball—one next played by adversary; *innocent* ball—ball last played by adversary; *rover* ball—ball that has made all the points except hitting the finishing stake.

The Game.—The game is played by from two to eight players. It needs no special dress, does not demand vigorous exertion, furnishes moderate exercise, and is not fatiguing even when long prolonged. The elements of the game are essentially the same however the wickets may be arranged, and whatever the ground. The object is to make the player's ball pass in succession through all the wickets, striking the lower or turning stake and the home stake, all in the order and direction indicated in the diagram. (Fig. 1.) In this journey, however, the player's ball may be aided by friends or retarded by enemies. The chief points of excellency are: 1, accuracy in *roqueting*, for which an accurate eye and trained hand are indispensable; 2, ability to secure *position* in front of arches; 3, skill in *wiring* an adversary's ball; 4, good *generalship*. Position in striking varies according to the player. It is well not to be too long in aiming; a quick stroke after getting the line between two balls is apt to be most accurate; but after the line of aim is secured, the eye should be kept fixed on the player's own ball. Important points to be observed are keeping your own balls *together* and *separating* those of your adversary; keeping the *innocent* ball of your adversary with you or your partner, and the *guilty* adversary ball wired; giving your partner a *set up* when you can make no further run; and, in making a run, providing for points ahead and leaving no balls behind.

Rules.—Following is a summary of the most important rules; some of the popular variations from them are also noted. The player must always strike his ball with the face of the mallet, the stroke being considered to have been "delivered" whenever the ball is moved by the touch of the mallet, however slight. The player must never strike his ball twice, and must not push or follow it with his mallet except in croqueting. The first play with each ball is made after placing it midway between the home stake and the first arch. The players play in regular order, partners alternating with opponents, and a player's turn continues so long as he makes a point or roquets a ball not dead, or until he violates some rule of the game. A point consists in running an arch or striking a stake in proper order of play. Roquet gives the player the privilege of roquet-croquet only, and in taking it he must move the croqueted ball or end his play. (In the popular game the player is not thus limited, and may besides take tight croquet instead; in either case he has also a second stroke.) If the player roquets two or more balls at the same stroke, he croquets only the first. A player, in each turn of play, may roquet any ball once only before making a point. Roqueting a dead ball by direct stroke ends the play, and the dead ball should be replaced. If a roqueted ball is beyond an arch, and the playing ball rests through it, the arch is held to be first made. A ball is not through an arch when it is touched by a straight-edge laid across the two wires on the side from which the ball came. A ball is not in position to run an arch when it has been placed under it in croquet, or when it rests under it, having been shot from the wrong direction. If a ball first roquets another, and afterward at the same stroke makes a point, the point is not allowed. A ball making two or more points at the same stroke gains no greater privilege than for making one only. (A popular exception is to allow an extra stroke the first turn if the player makes the first two arches at the same stroke.) If a ball not rover be driven through its arch or against its stake by croquet or concussion, it is a point for that ball. A ball shot over the boundary must be returned at right angles from where it stops before play can proceed. A rover has the right of roquet and of consequent croquet on every ball once each turn of play, and is also subject to roquet and croquet. Rovers must be continued in the game until partners become rovers and win the game by successively making the last point, i. e. striking the home stake.

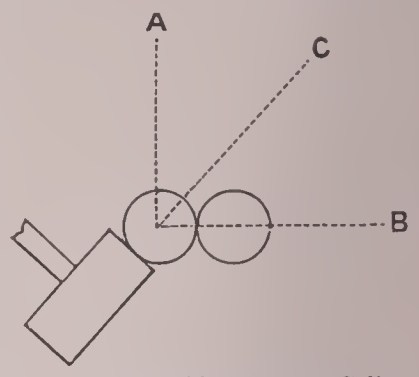


FIG. 3.—A possible croquet: C, line of aim; A, course of player's ball; B, course of croqueted ball.

Crosby, ALPHEUS: educator; b. at Sandwich, N. H., Oct. 13, 1810; graduated at Dartmouth in 1827; was tutor and Professor of Ancient Languages in his alma mater (1829–57), and principal of the normal school at Salem, Mass. (1857–65). He edited Xenophon's *Anabasis*, and published a Greek grammar and other works, which have been extensively used. D. in Salem, Mass., Apr. 17, 1874.

Crosby, HOWARD, D. D., LL. D.: b. in New York city, Feb. 27, 1826; graduated at the University of New York in 1844; became Professor of Greek in the same in 1851; Professor of Greek in Rutgers College, N. J., in 1859; pastor of First Presbyterian church in New Brunswick in 1861; resigned his pastorate in 1862, and his professorship in 1863, when he became pastor of the Fourth Avenue Presbyterian church in New York city. He was chancellor of the University of New York 1870–81, and one of the revisers of the New Testament. Of bold, ardent, and energetic temper, fearless in the defense of his opinions, wise and broad in his judgments, tireless in his energy, he was for years a synonym for every Christian virtue and a leader in every practicable reform. By his personality, and not by his pulpit gifts or scholarship, he filled so large a place in the city's philanthropies. His scholarship was put to popular use. Besides other works, he published *Lands of the Moslem* (New York, 1850); *Œdipus Tyrannus* (1851); *Notes on the New Testament* (1863); *Bible Manual* (1870); *Life of Jesus* (1871); *Book of Joshua* (1875); *The Christian Preacher* (Yale lectures on preaching, 1880); *Commentary on the New Testament* (1885); *Bible View of the Jewish Church* (1888); *The Seven Churches of Asia; or, Worldliness in the Church* (1890); *Sermons* (1891). D. in New York city, Mar. 29, 1891.

Crosby, JOHN SCHUYLER: soldier; b. in Albany, N. Y., Sept. 19, 1839; educated at University of New York; entered the regular army as second lieutenant of artillery in 1861; served with his battery under McClellan in the Army of the Potomac; was brevetted major and lieutenant-colonel after the battles of Pleasant Hill and Sabine Cross-Roads; was in 1864 promoted to the staff of Maj.-Gen. Canby as assistant adjutant-general, and shortly afterward transferred to the staff of Maj.-Gen. Sheridan in the same capac-

ity. He resigned his position in the army in 1872, and was in 1876 appointed U. S. consul at Florence, Italy; became Governor of Montana Aug. 4, 1882, and first assistant Postmaster-General Nov., 1884; resigned Mar. 4, 1886.

Crosby, Peirce: rear-admiral U. S. navy; b. near Chester, Pa., Jan. 16, 1824; entered the navy as a midshipman in 1838. He served on the east coast of Mexico during the Mexican war, and in 1861 was employed with the Union army, and rendered most important service in Chesapeake Bay and in the sounds of North Carolina, particularly at the capture of Forts Hatteras and Clarke. He commanded the Pinola at the passage of Forts St. Philip and Jackson and capture of New Orleans, Apr. 24, 1862, and at the passages up and down the Mississippi past the Vicksburg batteries, June 30 and July 15, 1862. He did good service during the years 1863–64 in command of the Florida and Keystone State, North Atlantic blockading squadron, and in 1865 commanded the steamer Metacomet during the operations which led to the fall of Mobile, superintending the removal of over 150 torpedoes. He was made rear-admiral in 1882, and retired in 1883. D. June 15, 1899.

Crosier, or **Crozier** [from O. Fr. *croce*, bishop's staff (Mod. Fr. *crosse*): Ital. *cruccia*: Span. *croza* < Vulg. Lat. **croccea* (*-us*), hook-shaped, adjec. to **croccum*, hook, a word of Germ. origin]: a staff curved at the top in imitation of a shepherd's crook (and pointed at the lower end), given to a Roman Catholic bishop at his consecration, and used by him as the symbol of the authority with which he rules his flock. It is also used by cardinals, by some canons of cathedral churches, and by abbots. J. J. Keane.

Cross [M. Eng. *crois*, *cros*, from O. Fr. *crois* (Mod. Fr. *croix*): Ital. *croce* < Lat. *crux*]: an instrument anciently used for inflicting the punishment of death, especially upon slaves and the vilest malefactors, and after the crucifixion of Christ the principal Christian symbol. As an instrument of death the cross occurred in the ancient world under a double form—either as a plain vertical stake, to which the convict was nailed with the hands above the head, or as a vertical stake provided with a cross-bar at the top, to which the convict was fastened in the same way, only with the arms outstretched. Death usually came after prolonged and frightful suffering. With respect to the cross on which Christ suffered death, the New Testament gives no indication of its form; only it is evident from John xix. 29 that it had a considerable height. But it seems almost impossible that the tradition which formed on this point, and which unanimously refers to the Roman cross—the vertical stake with the cross-bar—should not be correct. As a symbol the cross occurs under many different forms: the *crux immissa* or *crux ordinaria* (†), the Latin cross or cross of the Romans, on which Christ suffered; the *crux decussata* (X), the Burgundian cross, also called the cross of St. Andrew, because the apostle Andrew is said to have suffered martyrdom on it; the *crux commissa* (T), the Greek cross, on which the apostle Philip is said to have suffered death, also called St. Anthony's cross or the Egyptian cross, because by that St. Anthony is said to have destroyed the idols of Egypt; finally, the double cross (‡) and the triple cross, of which the first is used by the pope, the second by the Raskolniks, or the Russian sectaries. See H. Fulda, *Das Kreuz und die Kreuzigung* (Breslau, 1878); W. W. Blake, *The Cross: Ancient and Modern* (New York, 1888).

Cross in Heraldry.—(1) an ordinary composed of a pale crossing a fesse, and therefore occupying one-half at least of the field; but this size is only retained when the cross is *charged*—that is, has bearings upon it. In other cases the width of the arms is less. (2) A bearing or charge of which there are many forms, as the cross patty, the cross annulate, the cross crosslet. R. S.

Cross, Mary Ann: See Eliot, George.

Cross, Richard Assheton, Viscount: statesman; b. in Red Scar, England, May 30, 1823; educated at Rugby under Dr. Arnold, Trinity College, Cambridge; called to the bar 1849; elected to Parliament, Mar., 1867; Home Secretary in Mr. Disraeli's administration 1874; Home Secretary in Lord Salisbury's administration 1885; made viscount in 1886, and Secretary of State for India; Treasurer of the Inner Temple and Lord Privy Seal, 1895.

Crossbill: any one of several birds of the genus *Loxia*, whose members are characterized by having the points of the bill crossing one another obliquely. This feature, which is not found in any other birds, looks like a malformation, but is really peculiarly adapted for extracting seeds from fir-cones. The crossbills belong to the family of sparrows

American crossbill.

(*Fringillidæ*), and are found in Europe, Asia, and North America, especially in the northern parts, and usually in small flocks.

The common crossbill of the U. S., *Loxia curvirostra americana*, is a variety or sub-species, distinguished chiefly by smaller bill and brighter plumage, of the bird inhabiting Europe and Asia. It is about the size of an English sparrow; the female and young are of a dull greenish olive, mixed with gray, brightest on the head and rump; the adult male is bricky red, with blackish wings and tail. It is a very hardy bird, nesting in Maine in late winter or early spring, while the ground is still covered with snow. Its range varies with the severity of the season and abundance of cone-bearing trees, but it has been taken as far south as Washington, D. C.

The white-winged crossbill, *Loxia leucoptera*, is a larger, brighter colored species, and is furthermore distinguished by two white bars on the wings. This and the preceding species are often found together. A similar but larger species, *Loxia tænioptera*, occurs in Europe. The bright color of the males fades after death, or if the birds are kept in captivity, changing to a dull orange, or more rarely to a golden yellow. The largest member of the genus is the parrot crossbill, *Loxia pityopsittaca*, from Northern Europe, and a straggler in Great Britain. F. A. Lucas.

Crossbow: See Bow and Arrow.

Crosse, Andrew: electrician; b. in Somersetshire, England, June 17, 1784; and educated at Oxford. He commenced in 1807 experiments with a view to form artificial crystals by a voltaic battery, in which he was successful. In the course of many years spent in this pursuit he obtained not less than twenty-four mineral crystals similar in form to those produced by nature. These discoveries were not published until he explained them before the British Association for the Advancement of Science in 1836. Some excitement was produced in the same year by the apparent generation of insects of the genus *Acarus* during his experiments with a voltaic battery. (See Generation, Spontaneous.) D. July 6, 1855.

Crossed Check: a check across the face of which two transverse lines are drawn, and between which the words "& Co." are written by the drawer. The check is then said to be crossed "generally," and can be used only by paying it into some bank or to some banker. When the name of a bank or banker precedes the words "& Co.," the check is said to be crossed "specially," and can be used only by paying it into that particular bank or to that particular banker. The practice of using crossed checks is very common in Great Britain, and is resorted to for the purpose of security in case the check is lost. The effect of crossing a check upon its negotiability is regulated by statute.

F. Sturges Allen.

Cros'sen: town of Prussia; province of Brandenburg; at the confluence of the Bober with the Oder; 32 miles

S. E. of Frankfort (see map of German Empire, ref. 4–H). It has vineyards and manufactures of woolen cloth and hosiery. Pop. (1890) 6,657.

Cross-examination: in the law of evidence, the examination of a witness by a party against whom he is called to testify, and thus distinguished from a direct examination, which is had by the party calling the witness. The range of a cross-examination is much wider than that of a direct examination, the party examining being allowed to impeach the credit of the witness, and to show the inconsistency of his statements, his bias, his want of memory, and other matters tending to reduce the value of his testimony. The course of the examination, depending on the circumstances of the case, must be largely left to the discretion of the presiding judge. For these reasons leading questions are regularly allowed, though they are in general excluded on the direct examination, as tending to make the answers of the witness mere echoes of the questions asked. It is, however, a rule that if a merely collateral question be asked and answered, the cross-examining counsel will not be allowed to call witnesses to disprove the truth of the answer. This rule would not extend to a question as to the point whether the witness had not previously given a different version of the facts from that to which he testifies. If such a question is properly put to him as to time, place, and circumstances, and he answers in the negative, he can be contradicted by other witnesses. The same remark may be made as to a question put to him as to expressions used by him showing hostility toward the party against whom he is called. A witness on cross-examination can not be required to answer whether he has committed a crime the commission of which would subject him to punishment, or has done any act which would subject him to a forfeiture of his estate; though this rule does not extend to an answer which would merely expose him to a civil liability. So he may, to a certain extent, be compelled to answer questions tending to discredit and degrade him. Thus, according to the better opinion, he may be asked whether he has not been confined in the State prison, as the object of the question is not to exclude him from testifying, but to affect the credit due to his statements. He could be shown to be *incompetent* to testify only by the production of the record of his conviction. The true theory of a cross-examination is to qualify the direct testimony, and accordingly the witness should not at this stage of the case be called on by the cross-examining counsel to give independent testimony sustaining his part of the issue, though this rule is not always adhered to in practice. See EVIDENCE. T. W. DWIGHT.

Cross Keys: a post-office of Rockingham co., Va. (for location of county, see map of Virginia, ref. 5–F). An indecisive action took place here on June 8, 1862, between the armies under command of Gens. Fremont and Jackson, in which Fremont was held in check during the day, and Jackson withdrew his forces at night.

Revised by J. MERCUR.

Cross, Orders and Congregations of the: in the Roman Catholic Church, are numerous. Of greatest interest are (1) the spiritual order founded by Theodore of Celles in 1211. It spread through Belgium, France, Holland, Germany, and England, and still exists. (2) The Regular Clerks of the Holy Cross, founded in 1834 in France by Abbé Moreau, and represented in the U. S. (3) A congregation of Daughters of the Holy Cross, founded in 1625 in France, and spread to Quebec, Canada. It is principally engaged in teaching. A second congregation of the same name was founded in 1833 in Belgium. In 1890 it had some 800 members.

Cross Remainders: remainders in two or more persons so created that the survivor or survivors take the whole on the death of the others. Cross remainders may arise by implication in a will, but can arise only by express limitation in a deed. F. STURGES ALLEN.

Cross, The Southern: a noted constellation of the southern hemisphere, some of the principal stars of which form a cross. Being near the south pole, it is not visible far north of the equator. As it is not conspicuous in proportion to its celebrity, the first sight of it is apt to be disappointing.

Crotala'ria [from Gr. *κρόταλον*, rattle, in allusion to the inflated pods whose seeds rattle]: a genus of mostly tropical, herbaceous, or sub-shrubby plants of the Bean family (*Papilionaceæ*), bearing mostly yellow flowers, and simple or palmately compound leaves. Some 200 species have been described, but these probably must be reduced to about 120. Nine species are natives of North America, of which the best known is *C. sagittalis*, the common rattlebox of moist lands, once thought to be the cause of a "loco disease" in horses and cattle, but probably harmless. C. E. B.

Crotalus: See RATTLESNAKE.

Crotch, WILLIAM: musical critic; b. in Norwich, England, July 5, 1775. He showed when an infant so precocious a talent for music that Dr. Charles Burney gave an account of the prodigy in the *Philosophical Transactions of the Royal Society* (1779). In 1797 he was appointed Professor of Music at the University of Oxford, and in 1822 principal of the Royal Academy of Music in London. As a composer he did not fulfill the great expectations he had awakened, though he published many vocal and instrumental compositions, but as a critic and historian his works are still of interest: *Elements of Musical Composition and Thorough-bass* (1812); *Styles of Music of All Ages* (1813). D. at Taunton, Dec. 29, 1847.

Crotchet [Fr. *crochet*, a little hook: dimin. of *croc*]: in music, one of the notes or characters of time, equal to half a minim.

Cro'ton [Gr. *κρότων*, a tick, in allusion to the appearance of the seeds]: a genus of about 500 species of trees, shrubs, and herbs of the SPURGEWORTS (*q. v.*), nearly all of which are natives of the tropical countries of both hemispheres. They are stellate-downy, scurfy or glandular-hairy, and bear alternate or rarely opposite, mostly entire, simple leaves. The flowers are monœcious or rarely dicœcious, and usually bear petals. The ovary is three-celled, and contains one ovule in each cell. Over twenty-five species occur in the Southern U. S., four of which extend into the Northern States. *C. tiglium*, a small tree native of China, produces seeds about one-half inch in diameter, which are known as croton seeds, and are extensively used in medicine. From them a drastic purgative oil is obtained. C. E. B.

Croto'na, or **Cro'ton**: an ancient Greek city of Italy; on the Bruttian peninsula and on the Mediterranean Sea. It was founded 710 B. C., and became a populous and important city. The Crotonians worshiped Hercules as their tutelary divinity, and, led by the famous athlete Milo, they in 510 B. C. conquered Sybaris and leveled it with the ground. The decline of Crotona began with the arrival of Pythagoras. The city was originally governed by a council of 1,000—men who descended from its Achæan founders—but 300 adherents or disciples of Pythagoras once succeeded in overawing the council and seizing the supreme authority. They were soon expelled by the people and a democratic form of government established, but from that time the stability of the government was lost, and the effects of the loss soon became visible. During the war between Pyrrhus and the Romans the city suffered still more; one-third of the space within the walls was unoccupied. During the latter years of the second Punic war Hannibal took up his headquarters at Crotona during three successive winters, which seems to have completed the ruin of the city. It is mentioned again in the wars of Narses and Belisarius. Its site is now occupied by Cotrone. In the days of its prosperity its territory was extensive, stretching from sea to sea, and it was noted for its salubrity. To this circumstance—the healthfulness of the situation—was ascribed the great personal beauty of the youths and maidens of the city, though the Crotonian method of training and education was also celebrated.

Croton Aqueduct: See AQUEDUCT.

Croton Bug: See COCKROACH.

Croton Chloral: See CHLORAL.

Croton Oil (*Oleum tiglii*): the expressed oil of the seeds of *Croton tiglium*, a small tree which grows in Hindustan, Ceylon, and other parts of Asia. In taste it is hot and acrid, varies from a pale yellow to a reddish-brown color, has a faint, peculiar smell, and is miscible with alcohol, ether, and oil of turpentine. It is a powerful purgative, valuable because it can be employed with good effect in very minute portions. Great care must be used in its administration. It is applied externally as a counter-irritant in neuralgia, epilepsy, and pulmonary diseases. The pale oil comes directly from India; that of a darker color is expressed after importation.

Croton River: in New York State; rises in Dutchess County; flows S. and southwestward through Putnam and Westchester Counties. It enters the Hudson river about 35 miles above New York city, which derives from the Croton its chief supply of water. Its length is estimated at nearly 60 miles.

Crouch, Frederick William Nicholls: musician; b. in London, July 31, 1808; son of a violoncello player; in early life sang in several traveling opera and concert companies; instructed in music by his mother and William Watts, secretary of the London Philharmonic Society; played the violoncello in the orchestra of Drury Lane theater; became pupil of Hawes, Attwood, Crevelli, and the Royal Academy of music; set to music Mrs. Crawford's *Kathleen Mavourneen*, when a boy; played in the orchestra at the performance of *Clari, the Maid of Milan*, Bishop's opera and John Howard Payne's libretto, containing the song *Home, Sweet Home*; removed to the U. S. in 1849, giving concerts in various cities with success; was in Richmond when the civil war began, and joined the Confederate army; after the war married a Virginia lady and soon after removed to Baltimore. He composed many songs and some church music, but his fame rests almost entirely on his *Kathleen Mavourneen*. D. at Portland, Me., Aug. 18, 1896. D. E. Hervey.

Croup: an inflammation of the lining membrane of the larynx, causing a greater or less amount of obstruction to breathing by virtue of swelling, development of false membrane, or spasm. Two varieties are distinguished—catarrhal or spasmodic laryngitis, or false croup; and diphtheritic or croupous laryngitis, or membranous croup.

1. *False croup* is usually a mild disease, most frequently seen during the second year of life, males being particularly liable. A marked tendency to it seems to exist in some individuals and families. Among the exciting causes may be mentioned exposure to cold and wet, gastric disturbances, bad hygiene, etc., usually most frequent during the wet winter months. The lining membrane of the larynx is reddened and swollen, its lumen therefore decreased and the passage of air impeded, which condition is aggravated by a spasmodic action of its muscular apparatus. The secretion of mucus is at first diminished, then increased, assuming a tenacious character. The onset of the attack is sudden or it is preceded by a nasal or bronchial catarrh, and usually occurs at night after the child has been asleep for several hours. It wakes up about midnight with a barking cough, loud and laborious respiration, small and frequent pulse, with more or less fever. In the more severe cases the veins of the neck and face are distended, the face looks leaden, and suffocation appears imminent. The attack may last from half an hour to six hours, terminating in perspiration, looser cough, and hoarse voice. Such attacks may repeat themselves on the following two nights. In this affection there is no development of false membrane and there are no swollen glands. A very severe attack requires the use of an emetic, such as ipecac, sulphate of zinc, or turpeth mineral, relieving the dyspnœa; milder attacks require very little or no treatment. The inhalation of moist warm air is of service. Let the child drink a little hot milk at short intervals. It should not sleep longer than an hour at a time, and drink on waking. A mustard plaster or cold water applied externally may be of service. When the breathing is very spasmodic, half a teaspoonful of paregoric (one dose) or a grain of Dover's powder is indicated. For the following general catarrh keep the child in a uniform warm but not hot room for a few days, the air being kept moist by steam; at the same time frequent small doses of ipecac, antimonial preparations, or muriate of ammonia may be given. All the cases do well. Good general hygienic habits do much to prevent attacks.

2. *Membranous croup*, or diphtheritic laryngitis, an exceedingly contagious affection, with its frequent complicating conditions, is the most dangerous disease seen in children. Under ordinary circumstances with an exclusively medical treatment a large majority of the patients die. Of late years operative measures relieving the laryngeal obstruction have more frequently been employed, and they tend to decrease the high mortality of the disease; the complications, however, continue to keep the death rate very high. It consists of an inflammation of the lining membrane of the larynx, swelling and formation of a white, gray, or through admixture with a little blood, darker "false," "croupous," or "diphtheritic" membrane on it, tending to diminish the lumen of the organ. This condition seldom originates in the larynx, but most frequently descends from the throat, where it is found covering one or more small areas or over a larger surface, also at times covering the inner surface of the nose. Micro-organisms described by Klebs-Löffler are now recognized as the causative factor. Their chemical products probably also play a part, especially in regard to the general systemic disturbances. The described deposits in the throat may be known to exist for days; the infection may then descend to the larynx. The voice becomes hoarse, resulting at times in complete loss of it (aphonia); the respiration is slow, labored, and loud, and in the efforts at breathing the muscles of the neck and chest are exerted to the utmost, the insertion of the diaphragm is drawn in with every inspiration—at the same time deep grooves are observed above and below the clavicle—the child is exceedingly restless, tosses about, and supports itself on its knees, throwing the head backward. The lips begin to assume a bluish hue. This symptom (cyanosis) increases in proportion to the difficulty experienced in breathing, and is due to an insufficient supply of oxygen to the blood—as it increases we observe general paleness, even a leaden color; blue tint of the lips and under the finger-nails. This condition may soon be followed by apathy in place of the restlessness, gasping respiratory attempts, and, unless the obstruction be relieved, convulsive twitchings, a loss of consciousness, and death by suffocation. Unfortunately, the loss of consciousness is not constant, many children dying with undisturbed intellect. At the same time there is great prostration, sometimes fever, and weakened heart's action, shown by a rapid, irregular pulse, cool surface, and cold extremities. When the obstruction to breathing is not so severe, or has been relieved by one of the various methods described below, an extension of the disease downward throughout the bronchial tubes, a bronchitis, a pneumonia, or poisoning of the whole system by the septic infection, very frequently cause death.

Medical treatment of this disease is very unsatisfactory, and there is no condition seen in childhood which appears more cruel. As to the medical treatment at the present day the best results seem to follow the use of rather large doses of corrosive sublimate at frequent intervals. Tincture of chloride of iron and chlorate of potash in proper doses are also of value. At the same time an abundance of fresh air, proper nourishment, alcohol and other heart stimulants, ice pills, external cold applications, moist air by means of steam spray, with perhaps a mild antiseptic added. When the temperatures are high, cautious use of antipyretics. The mouth and nose may be protected from infection by frequent cleansing with mild antiseptics. When the obstruction to breathing is severe an emetic may be of service when the membranes are loosened, or where there is a large quantity of mucus in addition. If used at all it should be with caution, as emetics tend to depress the general condition. Most cases resist treatment, and surgical interference is the only means to prevent suffocation. Tracheotomy saves 25 per cent. or more of the cases. It is an operation consisting in the artificial opening of the windpipe below the obstructed larynx. This is kept open by means of a silver or hard rubber tube inserted into it until the disease has disappeared. Intubation, or the introduction of a specially devised tube into the larynx through the mouth without a cutting operation, has largely taken the place of the former procedure. It was invented by Dr. J. O'Dwyer, of New York. It seems to present more encouraging results; the percentage of recoveries is the same as in tracheotomy.

The relief following the one or the other operation is surprising, and, although the mortality is still very great, death is almost always easier, resulting rather from the complicating conditions than from suffocation. A. Jacobi,
F. E. Sondern.

Crow: a name popularly applied to several birds of the genus *Corvus*, which includes also the ravens, the rooks, the daws, and some other birds. They are characterized by a comparatively short tail, long wings, strong, rather conical beak, and generally uniform glossy black plumage. Crows are distinguished from ravens by their smaller size, and by the feathers of the neck blending with those of the body, while in the ravens the neck feathers are pointed and distinct. Although the crow family is widely distributed, the crows, as popularly understood, are mainly inhabitants of the north temperate zone and no true crow is found in South America. They are intelligent, wary birds (when persecuted), and are practically omnivorous, feeding upon

fish, flesh and fowl, eggs, snakes, frogs, crabs, shell-fish, grubs, fruits, seeds, and berries. The common crow of North America is particularly abundant in the Eastern U. S., and is generally looked upon as the inveterate foe of the farmer from the amount of injury it inflicts on growing

Hooded crow of Europe.

crops, and especially upon corn. There is, it is true, a credit side to the account in the destruction of grubs, but as the crow is a great destroyer of the eggs and young of other and beneficial birds, it must, on the whole, be regarded as harmful. The crow can also be charged with disseminating the seeds of the poison sumach (*Rhus venenata*), which form a considerable portion of its food in fall and winter. At these seasons of the year crows assemble by thousands in great roosts, or rookeries; one of these roosts, on the Potomac, above Washington, has been estimated to contain 40,000 crows, while others are still larger. In the gray of the morning the birds leave in clamorous crowds for their feeding-grounds, often many miles away, and in the afternoon they may be seen winging their way homeward in long lines, high above the earth in fair weather, low down in foul. The Eastern fish crow (*Corvus ossifragus*), frequently found in company with the preceding, is a smaller bird, and can readily be distinguished by its hoarse caw. The carrion crow of Europe and Asia (*Corvus corone*) closely resembles the North American crow in form, size, and habits, but is perhaps a little more destructive, attacking and killing lambs, or even weakly sheep. The hooded crow (*Corvus cornix*), found in Northern and Eastern Europe and in many parts of Asia, is gray, with black head, throat, wings, and tail. These two species interbreed, and hybrids between them are common. The gray-necked crow of India (*Corvus splendens*) is a small but bold and mischievous species, stealing the very food from the table. On the other hand, it does much good as a scavenger, forming an able adjunct to the vultures in this respect. See Chough, Raven, and Rook. F. A. L.

Crowe, Catherine (*Stevens*): author; b. in Kent, England, in 1800; married Lieut.-Col. Crowe in 1822, and spent much of her after-life in Edinburgh. In 1838 she published a tragedy entitled *Aristodemus*, which was followed by novels and other works, some of which, like her *Night Side of Nature* (1848), dealt with the supernatural. D. in 1876.

Crowe, Joseph Archer, C. B., K. C. M. G.: journalist and art-writer; b. in London, Oct. 25, 1825; foreign editor of the *Daily News*; correspondent of *Illustrated London News* during Crimean war, and of the *Times* during the Indian mutiny and during the Franco-Prussian war; from 1857 to 1859 director of the Art School at Bombay; in 1860 appointed consul-general at Leipzig, and in 1878 at Düsseldorf; in 1882 became commercial *attaché* at Paris; secretary and protocolist to the Danube conference in London, 1883; British plenipotentiary to the Samoan conference in Berlin, 1889; member of Niger delimitation commission, 1892; editor of editions of Burckhardt's *Cicerone* and Waagen's *Handbook of Italian Painting*, and author, with G. B. Cavalcaselle (*q. v.*), of several works of art. D. Sept. 8, 1896.

Crowe, Winfield Scott, D. D.: preacher and editor; b. in Indiana, Nov. 15, 1850; educated at Stockwell College (A. B. 1871), and Northwestern University; pastor of Second Universalist church, Chicago, and of First Universalist church, Newark, N. J.; editor of the *Universalist Monthly*, an organ of the progressive party in the Universalist denomination; author of *The Man of Evolution*; *The God of Evolution*; *The Lordship of Jesus*; and *Phases of Religion in America* (1892).

C. H. Thurber.

Crowfoot: any plant of the family *Ranunculaceæ*. Plants of this family are characterized by having all parts of their flowers separate, and usually numerous. The flower is thus but a slightly altered shoot, and may be regarded as the typical or primitive flower of the dicotyledons. C. E. B.

Diagrammatic section of the flower of a crowfoot.

Crown: a decorative wreath, ring, or cap, intended to be worn on the head, and used either for ornament at times of festivity, or as an honorary badge, or as a mark and symbol of high rank—especially, in modern times, the mark of sovereignty. The fillet or diadem of the ancient Oriental nations and adopted by the Greeks can hardly be called a crown, nor should the Persian tiara be called so, and the tiara of the pope is really a cap adorned by three crowns which surround it. Crowns of olive, laurel, etc., and wreaths of various flowers were used by the Greeks very freely at feasts and ceremonies, and as prizes in athletic and other contests, each plant when so used having its especial significance; and similar wreaths and garlands were made of gold and other metals in imitation of natural foliage. Such crowns, made of leaves of thin gold, are found in tombs and are common in modern museums. The Romans imitated the Greeks in their use of such wreaths. One such was granted to a general who had caused the siege of a town to be raised; it was made of plants which grew within the place. In like manner the *civic crown* was given to one who had saved the life of a citizen, and the *naval crown* (called *corona rostrata* because it was adorned with figures of beaks of ships) was granted to a victor in naval warfare. A corpse was crowned on the occasion of funeral rites, and both bride and groom at a marriage ceremony.

The metal crown, with sharp upward-pointing rays, is probably of Oriental origin, and when originally used in the West denoted deification. In this sense it is added to portraits of Roman emperors made after death, beginning with Augustus, although it is probable that no kind of crown was assumed by any emperor during his lifetime before the time of Constantine, more than three centuries later. In the Middle Ages crowns were of many forms. It came gradually to be considered that a mere ring around the head, even if adorned with spikes or flowerlike ornaments on the top, was of lower dignity, and that the crown of a sovereign prince should be closed at top, or should have arches over the head from side to side. The crown of the Kings of France had eight half arches meeting in the middle and carrying a kind of finial. The modern crown of the sovereigns of England has four half arches. Each of these crowns has a velvet cap within the arches and covering the head. Crowns of nobles not sovereign princes are generally called coronets. Russell Sturgis.

Crown and **Bridge Work** in dentistry: See Dentistry.

Crown and **Half Crown**: originally English gold coins issued by Henry VIII. in 1527. The first commission for coining them of silver was signed by Edward VI., Oct. 1, 1551. The crown is a silver coin worth five shillings sterling, or about $1.25 in U. S. money.

Crown Glass: the glass usually employed for windows. It is made of a mixture of 100 parts of sand, 35 of soda-ash or potash, and 35 of chalk. It is essentially a silicate of soda (or potash) and lime.

Crown Imperial: See Fritillary.

Crowninshield, Caspar: See the Appendix.

Crowninshield, Frederic: decorative painter; b. in Boston, Nov. 27, 1845. Began to study art in 1867 in London under Rowbotham; later studied in Rome under Benouville, and in Paris with Cabanel; worked also under Couture at Villiers-le-Bel. He first exhibited at the Paris Salon in 1878. He has great facility in painting in oil and water

colors, and is a competent draughtsman. Member Architectural League, New York. Studio in New York.
W. A. C.

Crown Point: town; capital of Lake co., Ind. (for location of county, see map of Indiana, ref. 2–B); on Ch. and Erie and the Panhandle railways, 40 miles from Chicago; has nine churches, graded and parochial schools, machine-shops, steel-mill manufactory, wagon, buggy, and broom factories, elevators, and electric lights. Pop. (1880) 1,780: (1890) 1,907; (1900) 2,336. BARTLETT WOODS.

Crown Point: a post-village, railway junction, and township of Essex co., N. Y. (for location of county, see map of New York, ref. 2–J). The township was first settled by the French, who in 1731 built Fort St. Frederick (the "Crown Point" of history) on a long cape projecting into Lake Champlain, which became the seat of thriving settlements, which were destroyed in 1759, and again in 1777, by the British troops. In 1775 it was surprised and taken by the provincial forces. The British fort at Crown Point, which cost with its outworks nearly $10,000,000, is now in a ruinous condition; but it was never of any great importance as a military post. Crown Point has extensive beds of rich iron ore and mineral phosphate of lime. Iron, lumber, and wooden wares are manufactured on an extensive scale. It has a lighthouse. Pop. of township (1880) 4,287; (1890) 3,135; (1900) 2,112.

Crown Prince (in Germ. *Kron Prinz*): in Prussia, Sweden, and some other European countries, is the title of the heir-apparent to the throne.

Crown, Treaty of the: a treaty made at Vienna, Nov. 16, 1700, in which the Emperor Leopold recognized the elector Frederick III. as King of Prussia. Frederick engaged to furnish 10,000 men to support Austria in the Diet, and to vote as elector for the descendants of the emperor's son, Joseph, King of the Romans.

Crows: See SIOUAN INDIANS.

Crowther, SAMUEL ADJAI, D. D.: Anglican Bishop of the Niger District, West Africa; b. in Ochugu, to the E. of the kingdom of Dahomey, 1812. Captured as a slave in 1819, he came ultimately upon a British man-of-war and was landed at Fourah Bay, Sierra Leone, in 1822. He was educated in Bathurst, West Africa; professed Christianity in 1825; became a missionary; hon. D. D., Oxford 1864, and Durham 1888; ordained deacon and priest 1843; consecrated missionary bishop in Canterbury Cathedral, St. Peter's Day, June 29, 1864. Accompanied the first Niger expedition (1841); missionary at Freetown, Sierra Leone, 1843; Abeokuta 1844–56; Lagos 1856–57; Niger 1857–64. Author *Yoruba Grammar and Vocabulary*; *Dictionary English and Yoruba and Yoruba and English*; *Elements of Nupe Grammar*. Translator of *Portion of the Old and New Testaments into Yoruba*; *Book of Common Prayer into Yoruba*; *Portion of St. Matthew in the Nupe Language*. D. in Africa, Dec. 31, 1891.

Croy'don: parliamentary borough of England; county of Surrey; 10½ miles S. of London bridge (see map of England, ref. 12–J). A hospital and a grammar school, founded by Archbishop Whitgift, and a Gothic church are among the principal buildings. There are thirteen railway stations. There are manufactures of church clocks and carillons. Owing to its nearness to London, of which it is practically a suburb, Croydon is the residence of large numbers of persons doing business in the metropolis. The Archbishops of Canterbury had a palace here until 1757. Since 1807 they have made Addington Park, 3½ miles distant, their summer seat. Pop. (1881) 78,953; (1891) 102,695; (1901) 133,885.

Crozer Theological Seminary (Baptist): located at Upland, Pa., 14 miles from Philadelphia. It was founded and endowed through the liberality of the members of the Crozer family, residents of Upland and Philadelphia, in 1868. In 1900 it had 7 professors, 102 students, an endowment of $462,500, and a seminary building, library building, gymnasium, Anniversary Hall, six professors' houses, and grounds 20 acres in extent.

Crozet Islands: in the Indian Ocean; 1,400 miles S. of Madagascar; in lat. 46° to 47° S. and lon. 52° E. There are five islands, called Inaccessible, Possession, East, Apostle, and Pig islands. They were discovered in 1772 by Capt. Marion, in 1840 by Sir James Ross, and in 1873 by the Challenger expedition. Though they are high, volcanic islands, they are seldom visible on account of the fog that prevails most of the year, and are therefore dangerous to navigation. British war-vessels occasionally visit them to rescue shipwrecked men. They have an area of 200 sq. miles, but no permanent inhabitants. M. W. H.

Crucible [from Late Lat. *cruci'bulum*, popularly connected with *crux*, cross, but really derived from Fr. *cruche* = Teutonic *krūka*, jug, dish; cf. Germ. *Krug*]: a vessel used by chemists in melting minerals, metals, etc. They are made of clay, porcelain, and other substances, and prepared so as to be capable of resisting extreme heat. Platinum crucibles are especially useful in chemical analyses.

Cru'cifers [Lat. *crux*, cross + *ferre*, bear]: the mustard family (*Cruciferæ*); one of the families of the dicotyledonous plants, including about 1,200 species, nearly all herbaceous, a few only being shrubby. They inhabit all countries, and are especially abundant in Southern Europe and Asia Minor. The parts of the flowers are all separate, except the two carpels which have united into a compound pistil. There are normally four sepals, four petals, six stamens, but some of these are often fewer or even wanting. The name crucifer alludes to the cross-like form of the flower when its four petals are expanded.

Many species possess a pungent volatile oil which is especially well developed in the mustard. A few species yield food, as the turnip (*Brassica rapa*), cabbage, cauliflower, etc. (*Brassica oleracea*), radish (*Raphanus sativus*), etc. Some species are ornamental, and a number are troublesome weeds throughout the world.
CHARLES E. BESSEY.

Crucifix: a cross with an image of Christ upon it, either carved or painted; found in use in all branches of the Church Catholic, except Calvinistic Protestantism; made in all sizes from the tiny pendant worn upon the breast to the towering life-size cross upon the wayside. It has come to be the commonest of symbols, and has directed untold millions in the path of religion. Yet it is far from being primitive. No crucifix has been found in the catacombs; nor is there any unmistakable allusion to one prior to the fifth century. The modern crucifix is in each detail an evolution. Drawings or sculptures of the naked cross came first; then the cross with a lamb, the affecting symbol of Christ, at its foot. The next step was to represent the lamb as bleeding beneath the cross, which was followed by the lamb upon the cross. No representation of Christ upon the cross appears till the fifth century. The earliest was in the form of a mere bust. In the middle of the fifth century the first mention of a crucifix appears (Gregory of Tours, *De Gloria martyrum*, 1, 2, 3). So rapid after their introduction was their spread that the Trullan synod of 692 decreed in its eighty-second canon that for the future the figure of the lamb on the cross should be supplanted by that of Christ. On the earliest crucifixes Christ was represented as alive and clothed, with his hands extended in prayer, and with a painless expression. In the tenth century the Greek artists first begun to represent him as dead. This gave great offense to the Latins, and widened the breach between the two Churches, but ultimately the Greek representation prevailed. So also the naked Christ, save for the loin-cloth, came to take the place of the more primitive clothed Christ, as it was more nearly correct. In the first crucifixes four nails were portrayed, the feet were put side by side; but from the thirteenth century only three nails are used, as the feet are crossed and pierced by a single nail.
SAMUEL MACAULEY JACKSON.

Crucifixion [from Lat. *crucifi'xio*, deriv. of *crucifi'gere*, crucify; *crux*, cross + *fi'gere*, fasten]: literally, "fastening on the cross," a form of capital punishment common among almost all ancient nations, except the Jews, who in their later history probably borrowed it from the Romans. The hanging on a tree spoken of in Deuteronomy xxi. 22 has reference to crucifixion *after death*. Tradition ascribes its invention to Semiramis. It consisted in nailing or binding the criminal, perfectly nude, to a cross piece (it was this rather than the upright which the criminal was required to carry) and then raising him, thus hanging, from the ground a foot or two and fastening the cross piece upon the upright stake, where he was left until dead from hunger or exhaustion. It was not general to nail the feet. The legs were frequently broken to hasten death; sometimes, however, a fire was lighted under the cross for the same purpose, or wild beasts were let loose upon those crucified. The body was usually left on the cross till destroyed by the action of the elements. Crucifixion was abolished by Con-

stantine the Great, probably in the year 315 (*Sozomen* i., 8).

This inhuman form of punishment was visited upon Christ by the Jews, in accordance with the unwilling sentence of Pontius Pilate. In addition to the scourging, which seems to have been a legal part of the punishment, he was forced to wear the crown of thorns, and subjected to other indignities by the brutality of the soldiers and populace. See the accounts given in the four Gospels, which give all the necessary details.

Revised by SAMUEL MACAULEY JACKSON.

Cru'den, ALEXANDER: author of the *Biblical Concordance*; b. in Aberdeen, Scotland, May 31, 1700. He was graduated at Marischal College, Aberdeen, and educated for the ministry of the kirk, but never preached, a disappointment in love, it is said, having brought on an attack of insanity, to which he had always had a tendency, and he was put under restraint. On his release in 1722 he removed to London, and taught the classics, and tried to teach French without knowing how it was pronounced. In 1729 he went to the Isle of Man. In 1732 he returned to London and opened a bookstore. In 1735 he became "bookseller" to Queen Caroline, wife of George II. In 1737 he published his *Complete Concordance of the Old and New Testaments*, which is still the best in the English language. He was several times an inmate of lunatic asylums, and during all the latter part of his life was flighty and extravagant. He set up as a reformer, calling himself "Alexander the Corrector." He died suddenly, while praying, at Islington, Nov. 1, 1770.

Cruikshank, GEORGE: illustrator and caricaturist; b. in London, Sept. 27, 1792. He worked with his father, Isaac, and his elder brother, Robert, and began to publish his work when only twelve years old, some very tolerable designs having been issued when he was fifteen. From this time until he was nearly eighty he produced etchings and wood-cuts incessantly. During his early life his most important work was in the way of large political and social caricatures, often colored, and often of extraordinary boldness. His attacks upon the prince regent, afterward King George IV., and equally upon the queen, who was the opposite party in a scandalous discussion and trial from 1815 to 1821, were unmeasured and ferocious. From about 1823 on his more important work was book illustration: *Points of Humor*, in 1823; Grimm's *German Popular Stories*, in 1823–27, with perhaps his most famous etchings; *Greenwich Hospital*, in 1825; *The Novelists' Library* in 1831, with illustrations to *Tom Jones*, *Humphrey Clinker*, *Roderick Random*, *The Vicar of Wakefield*, etc. *The Comic Almanack*, from 1835 to 1853, with twelve full-page etchings in each of the volumes but one or two; *Oliver Twist*, which began in *Bentley's Miscellany* in 1837, and was the only one of Dickens's novels illustrated by Cruikshank; *Rookwood*, *Jack Shepard*, *The Tower of London*, and other novels of William Harrison Ainsworth, some of which appeared first in *Bentley's Miscellany*; *The Ingoldsby Legends*, also from *Bentley*; *Frank Fairlegh*, *George Cruikshank's Fairy Library*, in which some of the old fairy-tales are told anew in the interest of total abstinence from alcohol, and are illustrated with charming etchings—all were published before he was sixty years old. After that time his work was less abundant and less vigorous, but had still great merit. One of the best things of his later work is the *Life of Sir John Falstaff* in large etchings, published in 1858. D. Feb. 1, 1878.

RUSSELL STURGIS.

Cruikshank, WILLIAM, F. R. S. L.: anatomist; b. in Edinburgh, Scotland, in 1746. He became a resident of London, and a partner of Dr. William Hunter. He published, besides other works, *Anatomy of the Absorbent Vessels* (1786). D. June 27, 1800.

Cruillas, MARQUIS OF: See MONSERRAT, JOAQUIN.

Crummell, ALEXANDER, D. D.: colored scholar and divine of the Protestant Episcopal Church in the U. S.; b. in New York city, Mar. 3, 1819; educated (1835) at Canaan, N. H. (where Dr. Highland Garnet was one of his companions), until the school was broken up by a mob of whites, and then (1836) at Oneida Institute, New York. Became a candidate for orders in 1839 under the direction of the Rev. Peter Williams, rector of St. Philip's church, New York; refused admission to the General Theological Seminary on account of his color. He was ordained deacon May 30, 1832, by Bishop Griswold. After studying with Rev. Dr. A. H. Vinton in Providence, R. I., he was admitted to the priesthood in Philadelphia by Bishop Lee, of Delaware. Unable to secure the education he desired in the U. S., he entered the University of Cambridge, England, and graduated with the degree of B. A. Removing to Liberia, West Africa, he was for a time professor in the Liberian College, and rector of a church as well. Returning to America, he became the rector of St. Luke's church, Washington, D. C. He received the degree of D. D. from Lincoln University, Pennsylvania. He wrote *The Future of Africa* (1862); *Greatness of Christ and other Sermons* (1882); *Africa and America* (1891); articles in *The African Repository*, etc. D. at Point Pleasant, N. J., Sept. 13, 1898. W. S. PERRY.

Crusade [probably from Provençal *crosada*, marked with a cross: Fr. *croisade*: Ital. *crociata* < Lat. type **crucia'ta*, deriv. of *crux*]: a war waged for the defense or advancement of the cross; specifically one of the religious wars carried on by the Christians of the Middle Ages for the recovery of Palestine from the Mohammedans. From a very early period the Christians were in the habit of making pilgrimages to Jerusalem and other parts of Palestine rendered sacred by events connected with the Saviour's life and death. These pilgrimages continued with but little opposition till the year 1065, when Palestine, then governed by the Egyptian caliphs, was overrun and conquered by hordes of Seljook Turks. The accounts (doubtless often exaggerated) of the indignities inflicted on the Christian residents and pilgrims by these barbarians produced a deep and powerful impression in all parts of Christendom. At length, Peter the Hermit, a monk and native of Amiens in France, having visited Palestine and witnessed the cruelty of the Turks, reported what he had seen to Urban II., by whom encouraged he traveled through Italy and France, and by his zeal and eloquence excited an extraordinary religious enthusiasm among all classes. In 1095, at a council held at Clermont, a crusade was resolved on. On this occasion the pope himself addressed the multitude. Previous to the setting out of the true crusade, four armies, consisting of disorderly multitudes of the very dregs of Christendom, had departed for Palestine. The first consisted of 20,000 foot, commanded by Walter the Penniless. It marched through Hungary, but was almost entirely destroyed by the natives of Bulgaria, a few only escaping to Constantinople. It was followed by a second, consisting of 40,000 men, women, and children, under Peter the Hermit. The two united at Constantinople, crossed the Bosphorus, and encountered the Turks at Nice. They were utterly routed. Another unorganized band of 15,000 Germans was cut to pieces in Hungary, and its fate was shortly shared by an immense mob of 200,000 persons from England, France, Flanders, and Lorraine. It was only now that the true crusaders entered upon the scene. Six armies, embracing all the chivalry of Europe, and led respectively by Godfrey of Bouillon, Hugh the Great (Count of Vermandois), Robert Curthose, Count Robert of Flanders, Prince Bohemond of Tarentum (under whom was Tancred), and Count Raymond of Toulouse, set forth for Constantinople. Having united their forces and spent some time at this place, they crossed into Asia Minor. Here their first step was the capture of Nice, June 24, 1097. They also defeated the Sultan Soliman at Dorylæum, and took the principality of Edessa. They then marched into Syria, and laid siege to Antioch. After seven months' siege, during which the crusaders suffered terribly from famine and disease, the city surrendered June 3, 1098. The inhabitants were massacred by their captors, who were besieged in their turn by an army of 200,000 Mussulmans. On June 28, 1098, the Mohammedans were put to rout, and the way opened to Jerusalem. In the summer of 1099 40,000 crusaders, the remnant of a vast host which had comprised not less than 600,000 warriors, laid siege to Jerusalem. The city was taken on July 15, after a siege of somewhat more than five weeks. Eight days later Godfrey of Bouillon was elected King of Jerusalem.

The three Latin principalities of the East (Edessa, Antioch, and Jerusalem) maintained themselves against the attacks of the Mohammedans till the year 1144, when the Emir of Mosul conquered Edessa and massacred its Christian inhabitants. His son, Noor-ed-Deen, marched upon Syria and Palestine. A second crusade was preached by St. Bernard, Abbot of Clairvaux, and in 1147 two armies, numbering together 1,200,000 men, set out for Jerusalem. They were commanded by Louis VII., King of France, and

Conrad III., Emperor of Germany. This expedition utterly failed through the treachery of the Greek emperor, Manuel Comnenus, and neither army ever saw the Holy Land.

In 1187 Salah-ed-Deen (or Saladin), Sultan of Egypt, invaded Palestine, and in October of that year took Jerusalem. This event gave rise to a third crusade, under the leadership of Frederick Barbarossa, Emperor of Germany, Philippe Auguste, King of France, and Richard Cœur-de-Lion, King of England. Barbarossa died of fever on the way. The crusaders gained some important victories, but they were not united among themselves, and the crusade was closed by a treaty in which Saladin agreed to impose no taxes on Christian pilgrims to Jerusalem. In 1195 Henry VI. of Germany, undertook a crusade (sometimes called the fourth), but the death of the emperor caused the project to be abandoned. A fourth crusade, instituted by Pope Innocent III. in 1203, turned from its course to take possession of the Byzantine empire, and never reached Palestine at all.

The Children's Crusade in 1212 (of which an excellent account has been written by the Rev. George Zabriskie Gray, New York, 1870) is one of the strangest episodes in history. An army of unarmed French children, 30,000 strong, headed by a boy named Stephen, set out for the Holy Land by way of Marseilles. A similar army of German children, 20,000 strong, led by a boy named Nicholas, crossed the Alps at Mont Cenis. A second army of German children, numbering nearly 20,000, the name of whose leader is not known, crossed the Alps by a more easterly route, touching the sea at Brindisi. Their idea was that the Mediterranean would open a path for them to Palestine, and that the Holy Land would be recovered and the Moslems converted by miracles. Some of the children got discouraged and returned to their homes; many stopped by the way; but most of them either perished on the march, were lost at sea, or were sold into slavery.

In 1228 Frederick II. of Germany commanded a fifth crusade, by which he became master of Palestine, and was crowned King of Jerusalem.

In 1239 the Turks having again seized upon Jerusalem, a sixth crusade was undertaken, under Thibaud, Count of Champagne. A nominal surrender of the Holy Land was the result.

In 1244 Jerusalem was burned and pillaged by a new race of Turks. A seventh crusade, headed by Louis IX. (St. Louis) of France, set out in 1249. It was badly defeated by the Sultan of Egypt, who also made a prisoner of the king. Louis obtained his freedom by the payment of a large ransom.

The eighth and last crusade was also undertaken by St. Louis in 1270. The king died at Carthage of the plague, and Prince Edward, afterward Edward I. of England, assumed the command of the army. The expedition accomplished nothing of importance, and in July, 1272, Edward returned to England with the last of the crusaders. The chief result of the crusades was a better acquaintance of the people of Western Europe with two civilizations more advanced than their own—the Greek and the Saracenic. Thus a powerful impulse was given both to the literature and the commerce of Europe. See besides Gibbon, Hallam, Milman, the special histories by F. Wilken (Leipzig, 1807–26, 7 vols.); J. F. Michaud (Paris, 1825; 9th ed. 1856, 4 vols.; Eng. trans., n. e. New York, 1881, 3 vols.); B. Kugler (Berlin, 1880; 2d ed. 1891) and for very brief treatment see G. G. Perry (London, 1865; 31st ed. 1872) and G. W. Cox (London and New York, 1875); for documents, Wilken's *Geschichte der Kreuzzüge*.

Revised by Samuel Macauley Jackson.

Cru'sé, Christian Frederic: scholar; b. in Philadelphia, Pa., June 27, 1794; in 1815 graduated with honor at the University of Pennsylvania, having been the first moderator of the Philomathean Society of that college; after several years as Lutheran minister, ordained in the Episcopal Church by Bishop White (1822); was assistant professor in the university in which he had been educated (1831–33); was rector of churches in several places; became librarian of the General Theological Seminary of the Episcopal Church, New York, 1853. D. in New York city, Oct. 5, 1864. He translated the *Ecclesiastical History of Eusebius Pamphilus* (Philadelphia, 1833) and the whole of Eschenburg's *Classical Manual*, only the part relating to Roman literature being incorporated in N. W. Fiske's translation (Philadelphia, 1836). W. A. Muhlenberg.

Cru'senstolpe, Magnus Jakob: Swedish author, journalist, and politician; b. in Jönköping, Mar. 11, 1795. His attacks on the Government in the early issues of his *Ställningar och Förhållanden* (Positions and Relations) caused his imprisonment 1838–41. Of more importance than his political tracts are his historical romances, e. g. *Morianen* (The Moor), 1840–44; *Carl Johan och Svenskarne* (Carl Johan and the Swedes), 1845–46; *Carl XIII.*, 1861, all of which, however, are written from the politician's rather than the historian's point of view. D. in Stockholm, Jan. 18, 1865.

G. L. Kittredge.

Crushing Machinery: See Grinding and Crushing Machinery.

Crustacea [Lat., shelly, adj., deriv. of *crusta*, shell]: a group of arthropodous animals, of which crabs, lobsters, shrimps, sow-bugs, beach-fleas, barnacles, etc., are familiar examples. They are like all Arthropods in having a jointed body with external skeleton, each joint bearing a pair of jointed appendages. Each joint or segment of the body is like its fellows in its broader features, but the segments are variously modified in the different regions of the body, being enormously enlarged at times, greatly reduced at others. Thus the two anterior segments are always very small, and the appendages are modified into "feelers" or antennæ. Behind these come several appendages adapted for eating, and still further back are the true limbs for locomotion. The mouth is below, just behind the antennæ; the "stomach" is frequently modified for chewing the food (the "lady" in the lobster); just behind the stomach the "liver" (more like a pancreas) pours in its secretions, the intestine is straight, the vent nearly terminal. The nervous system consists of a brain in front of the mouth, and a chain of secondary nervous centers, frequently considerably consolidated, lying along the floor of the body. The heart is on the back, and may be either a long tube or a short sac. Arteries and veins are developed, but there is no capillary system, the blood flowing during a portion of its course in the spaces (lacunæ) between the muscles. Breathing is effected, in the smaller forms, by the general surface of the body, in the larger by gills which occur on some or all of the legs. In the palm crab of the tropics an apparatus simulating a lung has been developed for breathing air. In all excepting the barnacles the sexes are separate, and the genital ducts open near the middle of the body. Of structural features, the existence of two pairs of antennæ in front of the mouth, the character of the respiration, and the position of the genital ducts alone can be used to distinguish the Crustacea from spiders, insects, etc.

The Crustacea usually carry the eggs about with them until the time of hatching. The eggs are usually filled with yolk, and in all cases pass through a stage with a single eye, without body segments and with but three pairs of appendages. This is called the *nauplius* stage, and with most Entomostraca free life now begins. From the persistence of a nauplius stage in all Crustacea it was formerly thought that the Crustacea were derived from a nauplius-like ancestor, but this idea is now given up, the nauplius being regarded as a feature introduced by "acceleration of development." (See Evolution.) Most Malacostraca pass the nauplius stage in the egg, and many Decapoda hatch from the egg in a *zœa* stage, characterized by the possession of less than the full number of legs, a longer body, and frequently enormous protective spines.

The Crustacea are divided into Malacostraca (containing Decapoda (see also Crab), Tetradecapoda, and Entomostraca (*q. v.*), containing Phyllopoda, Ostracoda, Copepods, and Cirripedia. About 10,000 species of Crustacea have been described, most of them from the sea, a few from fresh water, still fewer being terrestrial. Phyllopods occur in rocks of Cambrian age: the Decapoda first appear in the Carboniferous. J. S. Kingsley.

Crutched Friars: appeared in England in the thirteenth century, and had monasteries in London, Oxford, and Reigate. From the staff which they carried in their hand, on the top of which was a cross, they received the name *croisiers*, which soon was corrupted into "crouched" or "crutched" friars. A street in London bears this name.

Cruveilhier, krü'vā'li-ā', Jean: a French anatomist; b. in Limoges, Feb. 9, 1791. He obtained in 1835 the chair of Pathological Anatomy created in Paris by Dupuytren. He published an important work on *The Pathological Anatomy of the Human Body* (2 vols., gr. fol., with 233 plates, 1829–40), and other works. D. at Jussac, near Limoges, Mar. 6, 1874.

Cruz, José Maria, de la: Chilian general; b. at Concepcion, Apr. 21, 1801. In 1811 he joined the revolutionary army as a cadet, served through the following campaign, retreated with Carrera to Mendoza after the defeat of Roncagua, and returned with the army of San Martin in 1818. From these youthful beginnings he rapidly rose in rank, and was trusted with important commands. In 1831 he was minister of war; in 1838 chief of staff of the army which invaded Peru, and became general of division in 1839; was again minister of war and marine in 1841, and the same year governor of Valparaiso and commandant-general of marine. In 1851 he was the liberal candidate for president, but was defeated by Gen. Montt; he then headed a revolt in the southern provinces, during which, it is said, 4,000 soldiers were killed. He was finally defeated at the bloody battle of Longamilla Dec. 8, 1851; amnesty being proclaimed, he retired to a farm, where he died Nov. 23, 1873. Herbert H. Smith.

Cruz y Goyeneche, Luis. de la: Chilian general; b. at Concepcion, Aug. 25, 1768. During the colonial period he held various civil offices, principally at Concepcion. In 1806 he made an important exploration over the Andes, discovering one of the most practicable passes; his report of this was published at Buenos Ayres by Angelis in 1835. He joined the revolutionists in 1810, was a member of the *junta* of Concepcion, and commanded a division in the patriot army, but was captured by Spanish guerrillas and long imprisoned in Peru and on Juan Fernandez. Released by the victories of 1817, he was named commandant-general of Tolca, and was acting president of Chili during the temporary absence of O'Higgins; went with San Martin's army to Peru 1820, where he was director-general of marine, and was made grand marshal in the Peruvian army; returning to Chili at the end of the war, he was a deputy to the Constituent Congress of 1826, and afterward Minister of Marine. D. Oct. 14, 1828. Herbert H. Smith.

Cry'olite [from Gr. *κρύος*, frost + *λίθος*, stone; so named because it melts in the flame of a candle]: a double fluoride of aluminium and sodium. It is snow-white when pure. It occurs in a large bed in gneiss at Evigtok, West Greenland, whence it is shipped to Pennsylvania for use in the manufacture of soda. The finely divided mineral is mixed with chalk and is fused. By lixiviation, sodium aluminate dissolves, calcium fluoride remains. By passing a current of carbonic acid through the solution, alumina is precipitated, a solution of carbonate of soda being thus obtained.

Cryoph'orus [from Gr. *κρύος*, frost + *φέρειν*, bear]: an instrument invented by Wollaston to freeze water by the absorption of heat arising from its own evaporation. It consists of a glass tube with a bulb at each end. One bulb contains water. A vacuum is produced in the tube and opposite bulb, and the empty bulb being placed in a freezing mixture, the vapor arising from the water is condensed, so that the water soon congeals in the other bulb, though the intervening tube be 2 or 3 feet long.

Crypt [from Gr. *κρυπτός*, hidden]: a vault under a church used either for sepulture or, in rare instances, as a chapel. Crypts generally do not extend beyond the limits of the choir or chancel, and some are of smaller dimensions. They were not common after the early Romanesque or Norman period, and where they exist under churches of a later date they are usually much older than the church. They seem to have been designed to receive the bodies of saints, martyrs, and Church dignitaries, and are in many cases beautifully though simply finished structures. One of the finest examples is that under Glasgow Cathedral; others are found under the cathedrals of Chartres, Canterbury, Hereford, and Gloucester, and under the churches of St. Mark at Venice and St. Eutrope at Saintes. There is a vast crypt under St. Peter's at Rome. Revised by A. D. F. Hamlin.

Crypto-Calvinists: a name applied in the last half of the sixteenth century to the followers of Melanchthon (called also Philippists), who earnestly desired the union of the Lutherans and Calvinists, and were charged with leaning too strongly toward the Calvinistic doctrine of the Lord's Supper. Also applied to the Missouri Lutherans, because they defend the doctrine of unconditional election as taught in the *Formula of Concord*.

Cryptog'amous Plants, or **Crypt'ogams** [from Gr. *κρυπτός*, hidden + *γάμος*, marriage]: all plants below the Phanerogams, or flowering-plants. The names were first used by Linnæus, who may have thus indicated his conviction that all plants possess sexuality. (They do not.) For a long time the vegetable kingdom was divided into two groups, as follows:

1. *Phanerogamia*, with stamens, ovules, seeds, and embryos.

2. *Cryptogamia*, without stamens, ovules, seeds, and embryos, and with spores. These distinctions, although long since acknowledged to be unscientific, are still maintained, especially in popular usage. The Cryptogams, instead of being a single group co-ordinate with the Phanerogams, include several such groups—e. g.: I. Water-slimes (*Protophytes*); II. Spore-tangles (*Phycophytes*); III. Fruit-tangles (*Carpophytes*); IV. Mossworts (*Bryophytes*); V. Fernworts (*Pteridophytes*). More commonly, instead of II. and III. as given above, we have II. *Algæ*, and III. *Fungi*, based upon physiological instead of structural characters.

Charles E. Bessey.

Cryptog'raphy [from Gr. *κρυπτός*, hidden + *γράφειν*, write]: the art of writing or telegraphing in cipher, or in such a way that the matter written can not be read by any one not in possession of the necessary key. Many plans have been devised for this purpose, but almost any person who has taste for the solution of puzzles or enigmas can readily understand most writing of this kind; and it is probable that no kind of cipher could be invented which would be proof against systematic and ingenious decipherers. Military and naval signals resemble cryptographic writing in this respect.

Cryptoproc'ta [from Gr. *κρυπτός*, hidden + *πρωκτός*, vent]: a carnivorous mammal, peculiar to Madagascar, related to the cats and civets; placed by Flower with the civets (*Viverridæ*), by Gill in a separate family (*Cryptoproctidæ*), of which it is the sole member. The skull and teeth somewhat resemble those of a cat, but the cranium is longer and narrower, the latter more numerous. The cryptoprocta, locally known as foussa, is about 5 feet long, including the tail, being the largest carnivore found in Madagascar; it is clothed with short, pale-brown fur; the soles of the feet are naked. The animal is plantigrade, climbs trees, is nocturnal, and savage when wounded. It is sufficiently powerful to carry away kids. F. A. Lucas.

Crypturi [from Gr. *κρυπτός*, hidden + *οὐρά*, tail]: an order of birds, so named because the tail feathers are very short and sometimes wholly concealed by the tail coverts. It contains only the Tinamidæ (*q. v.*).

Crystal: See Crystallography.

Crystalline Lens: See Eye.

Crystalline Schists: in geology, a generic term employed to designate more or less perfectly crystalline rocks which possess a distinct foliation or parallel structure. Such rocks are more abundantly developed in the earth's crust than any others. In some cases they can be proved to be metamorphosed or recrystallized sediments. In other cases they are igneous rocks which have been rendered schistose by shearing and pressure. Other causes of a foliated or parallel structure are the movement in a partly consolidated and viscous mass (flow structure), and the injection of cleaved rocks, whether igneous or sedimentary, by later eruptive material (injection gneiss). By far the most common of the crystalline schists is Gneiss (*q. v.*), which always contains feldspar. Others are hornblende, mica, sericite, quartz, chlorite, and ottrelite schists, crystaline limestone, and quartzite.

Many banded and foliated gneisses have the same chemical and mineralogical composition as well-known igneous rocks. The origin of crystalline schists may in certain cases be clearly made out, but in many others it will probably always remain problematical. No general theory of their origin can be relied on to explain all occurrences. See Gneiss, Metamorphism, and Rocks. G. H. Williams.

Crystallog'raphy [from Gr. *κρύσταλλος*, clear-ice (cf. *κρύος*, frost), crystal + *γράφειν*, write]: the science of crystals. A crystal is a natural or artificial solid, bounded by plane surfaces, which are symmetrically arranged around certain imaginary lines called *axes*. *Κρύσταλλος* originally meant "ice"; it was afterward applied to the transparent variety of quartz, because it was thought that rock-crystal was water turned into stone, and this idea was not challenged until the commencement of the seventeenth century; it was subsequently applied indifferently to any solid which assumed a geometrical shape by natural laws.

All crystals may be referred to seven systems, six of which

are referred to three axes, and one of them to four. These systems are divided into two classes, according as the axes are or not at right angles. Those which are at right angles are called the *orthometric*, and those which are not are called *clinometric* systems. In each one of them there are three varieties. When all the axes are equal and at right angles, the system is called *isometric*. When only two are equal, but all at right angles, it is called the *tetragonal*. When none of the axes are equal, but all are at right angles, it is called the *orthorhombic*. The *clinometric* systems are called, respectively, the *monoclinic*, the *diclinic*, and the *triclinic*, according as the axes have different inclinations. The single system of four axes is called the *hexagonal*.

In all of these systems one axis is placed upright, and is called the vertical axis. In the isometric, tetragonal, and hexagonal systems the other axes are simply called the basal axes, while in each of the other systems each axis has its own name. The axes always terminate in homologous parts, whether these parts are edges or angles.

The axes form a system of co-ordinates by which the position of any face may be determined. Taking the most general case of three unequal axes, the vertical axis is usually designated by c; the one from left to right, b; and the one from front to behind, a; c is always written last. Starting from the origin, the half-axes are determined as + or − (Figs. 43, 44); when all the axes are equal they are all designated by a. The distances on these half-axes, cut off by any crystal face, are called parameters. One of them can always be made equal to unity, so that $ma:nb:c$, with their signs, will always give the position of any crystal face with reference to a given variety of axes. When a face is parallel to an axis, it is said to cut it at a distance equal to infinity, and its coefficient for that axis will be so written, as $\infty a:\infty b:c$. Every face of a crystal which does not cut all the axes must either cut two or be parallel to two of them. According to Weiss, the symbol of *any* face will be $ma:nb:c$. Naumann simplifies it by using two letters, or their numerical values, and writing between them the capital letter which represents the type of the system—O for octahedron, P for pyramid, and R for rhombohedron. The two letters are always written in the same order: m is always equal to, greater or less than unity, and always greater than n, $m \gtreqless 1$, $m > n$; m therefore varies between zero and infinity, while n varies between one and infinity. The coefficient 1 is never written.

Dana's symbols are simply a contraction of Naumann's, in which the letters for the primitive form of the system are left out, and ∞ is written i. Thus, mOn becomes mn, and $\infty O\infty$ becomes ii. Miller's system consists in writing the reciprocals of the parameters in the order of the axis a, b, c; c being always the vertical axis. Thus $\infty P\infty$ becomes 010. They are always written in the same order, without any designation of the crystalline system. The letters hkl written in brackets $\{hkl\}$ indicate a complete form; written simply hkl, they indicate a form in which all the plus axes are cut; written $hk\bar{l}$, it indicates that the plane cuts a negative axis at the distance k.

In every crystalline system a single form is taken as the base of the system. Any form belonging to the system *may* be taken for this base, but it is generally conceded to adopt pyramids. From this form all the others are derived by three very simple laws: (1) All the similar parts of a crystal may be similarly and simultaneously modified. This gives rise to *holohedral* forms. (2) Half the similar parts may be similarly and simultaneously modified. This gives rise to *hemihedral* forms, which in some of the systems are known as *inclined*, *parallel*, or *gyroidal* forms. (3) One quarter of the similar parts may be similarly and simultaneously modified, giving rise to *tetartohedral* forms.

In the isometric system the modifications may be composed of one, two, three, or six planes; in the tetragonal and hexagonal, of one and two; in the orthorhombic, monoclinic, diclinic, and triclinic, of only one plane at a time.

ORTHOMETRIC SYSTEMS.

Isometric System.—1. *Holohedral Forms.*

Three axes, a, a, a (Fig. 1), all equal and at right angles. The base of the system is the octahedron.

Octahedron, O.—When the axes a cut in the relation $a:a:a$, the solid is made up of eight faces, which are equilateral triangles (Fig. 2). There can be but one octahedron.

Hexahedron, $\infty O\infty$.—When the solid angles of the octahedron are modified by planes which are parallel to two of the axes, and cut one at a distance equal to unity, the resulting solid will be a cube, and will have the symbol $a:\infty a:\infty a$ (Fig. 3).

Rhombic Dodecahedron, ∞O.—When the edges of the octahedron are modified in such a way that two of the axes are cut at a distance equal to unity, while the plane is parallel to the third, the symbol will be $a:a:\infty a$ (Fig. 4). There can be but one rhombic dodecahedron.

Tetrahexahedron, ∞On.—When the edges of the octahedron are modified, so that one of the axes is cut at unity, one at infinity, and one at n, the formula will be $\infty a:a:na$ (Fig. 5). As there is nothing to limit the inclination of the planes, there may be an infinite variety of tetrahexahedra (Figs. 5, 6, 7), the limit being ∞O on the one hand when $n = 1$, and $\infty O\infty$ on the other when $n = \infty$.

Trigonal Trisoctahedron, mO.—When the edges of the octahedron are replaced, so that two of the axes are cut at unity and the third at m, the formula is $ma:a:a$. Each plane of the octahedron becomes replaced by three triangular planes; hence the name trisoctahedron. As there is nothing to limit the inclination of the planes, there may be an infinite variety of trigonal trisoctahedra (Figs. 8, 9, 10). Their limit will be O on the one hand when $m = 1$, and ∞O on the other when $m = \infty$.

Tetragonal Trisoctahedron, mOm.—When the solid angles of the octahedron are modified so that two of the axes are cut at a distance m and the third at unity, the symbol will be $ma:a:ma$. The faces of the octahedron will be replaced by three tetragonal planes. As there is nothing to limit the inclination, there may be an infinite number of tetragonal trisoctahedra (Figs. 11, 12, 13). Their limit will be O on the one hand when $m = 1$, and $\infty O\infty$ on the other when $m = \infty$.

Hexoctahedron, mOn.—When the angles of the octahedron are modified so that each axis is cut at a different distance, the symbol will be $ma:na:a$. Each plane of the octahedron will be replaced by six triangular planes. As there is nothing to limit the inclination of the planes, there may be an infinite number of hexoctahedra (Figs. 14, 15, 16). This solid is the most interesting of all the solids of the system, for by successively changing the values of m and n all the other forms of the system may be derived from it. They can all be seen upon it in outline.

2. *Hemihedral Forms.*

In the isometric system there are three kinds of hemihedry: (1) *inclined*, (2) *parallel*, and (3) *gyroidal*. (1) The forms are said to be *tetrahedral* or *inclined* when the faces are not parallel. This is produced when all of the modifications are carried out on alternate homologous parts. (2) They are *dodecahedral* or *parallel* when alternate modifications are carried out in the same order on all the homologous parts. (3) *Gyroidal* forms are produced when alternate modifications are carried out alternately on all the homologous parts. The hexoctahedron is the only solid which allows of hemihedral forms according to all of the three laws.

(1) *Inclined or Tetrahedral Forms.*

Tetrahedron, $\pm \frac{O}{2}$.—When alternate faces of the octahedron are produced to the exclusion of the others (Fig. 17), a tetrahedron (Fig. 18) is formed. There can be but two tetrahedra, which are distinguished as + and −.

Hemi-Trigonal Trisoctahedron, $\pm \frac{mO}{2}$.—When mO is modified by this law, a tetrahedron is produced, each of whose faces is replaced by three tetragonal planes (Figs. 19, 20, 21, 22).

Hemi-Tetragonal Trisoctahedron, $\pm \frac{mOm}{2}$.—When mOm is modified by the same law, a tetrahedron is produced, each one of whose planes is replaced by three triangular planes (Figs. 23, 24, 25, 26).

Hemi-Hexoctahedron Inclined, $\pm \frac{mOn}{2}$.—When mOn is modified by the same law, a tetrahedron is produced, each one of whose faces is replaced by six triangular planes (Figs. 27, 28). The other forms, $\infty O\infty$, ∞O, and ∞On, do not admit of inclined hemihedry.

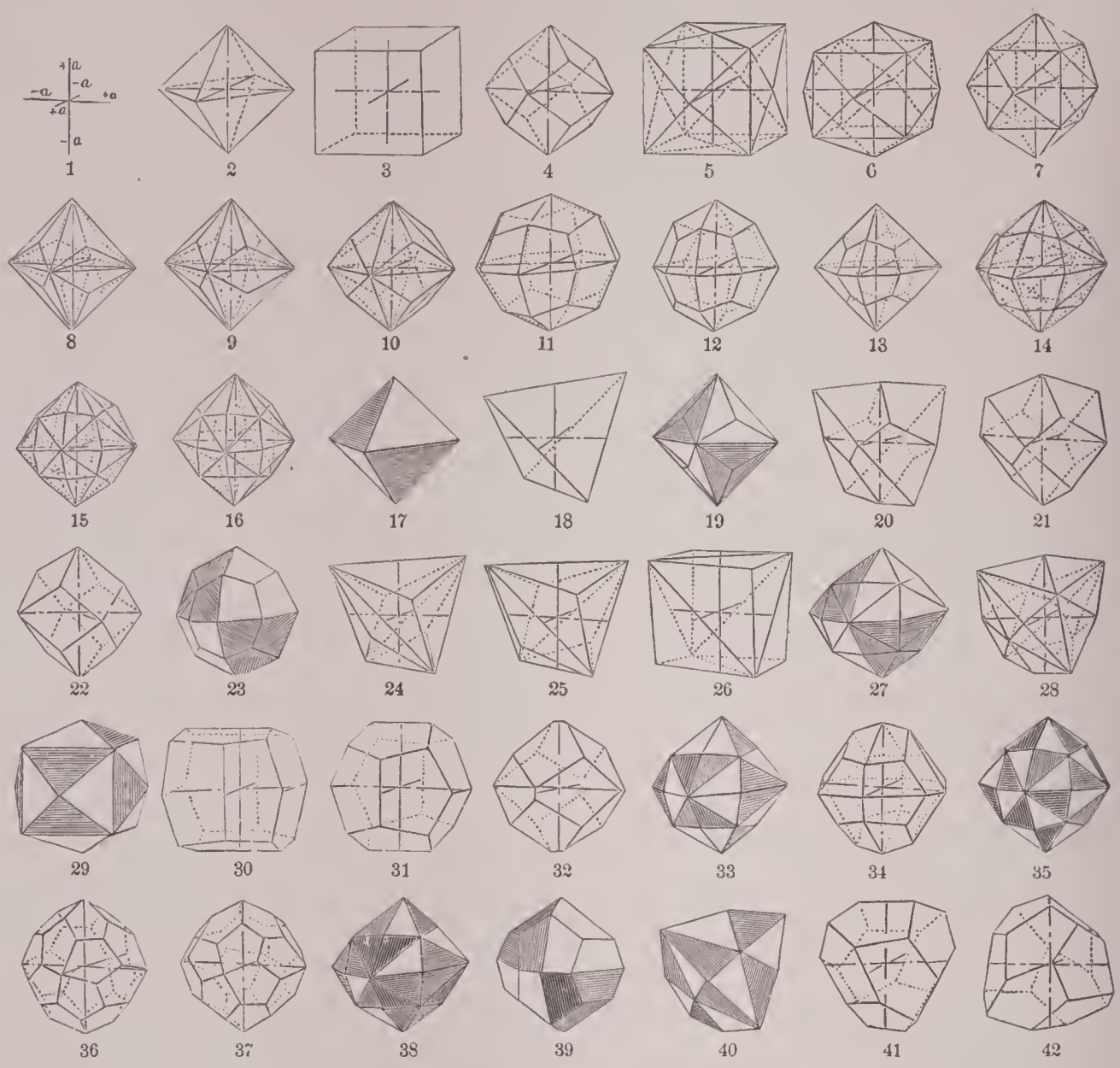
(2) *Parallel or Dodecahedral Forms.*

Hemi-Tetrahexahedron, ∞On.—When ∞On (Fig. 29) is modified, so that every alternate face is produced, a solid is

formed (Figs. 30, 31, 32), which is often called the *pentagonal dodecahedron.*

Hemi-Hexoctahedron Parallel, $\pm \left[\frac{mOn}{2}\right]$.—When mOn is modified so that every other plane is taken in the same order on each face (Fig. 33), a solid (Fig. 34) is produced, which is often called the *diploid.*

edges terminal angles and planes. The general formula for these pyramids is $a:a:mc$, for which the symbol is mP, in which $m \gtreqless 1$; but in that protopyramid P which is selected for the base of the system the value of m is taken for unity. As m may have any value, there may be any number of pyramids. They are called acute or obtuse according as the terminal angle is acute or obtuse.



Isometric system.

3. *Gyroidal Form.*

Gyroid, $\pm \left(\frac{mOn}{2}\right)$.—When mOn is modified in such a way that the faces are taken alternately above and below (Fig. 35), a solid having twenty-four pentagonal faces is produced (Figs. 36, 37). This solid has not been found in nature.

(3) *Tetartohedral Form.*

Tetartoid, $\pm rl \frac{mOn}{4}$.—mOn is the only form which allows of the carrying out of this law. When the hexoctahedron, the diploid, or the hemi-hexoctahedron inclined, is modified as shown in Figs. 38, 39, and 40, Figs. 41 and 42 are produced, and as there are two pairs of these, which are right and left forms, they are distinguished as + and − r and l.

TETRAGONAL SYSTEM.

The axes of this system (Fig. 43) are of two kinds: a, the vertical, being longer or shorter than b, b, which are both equal.

Holohedral Forms.—Closed Forms.

Tetragonal Pyramid of the First Order, P.—When the axes are cut in the relation $a:a:c$, the pyramid of the first order or protopyramid (Figs. 44, 45) is produced. The plane which includes the axes b is a square, and is called the basal plane, and its angles and edges are called basal angles and edges. The planes which include the axes a, b are rhombs, and are called the terminal planes, and their angles and

Pyramid of the Second Order, mP∞.—When the terminal edges of the protopyramid are modified by one plane in the relation $ma:\infty b:b$, a solid exactly similar in all respects to the protopyramid is produced, but turned 90°, so that the basal axes terminate in the center of the basal edges (Figs. 46, 47). As m may be $\lesseqgtr 1$, there may be an infinite number of deuteropyramids. The two forms, P∞ and 2P∞, occur where $m = 1$ in the first case, and $m = 2$ in the second.

Ditetragonal Pyramid, mPn.—When the terminal edges of the protopyramid are modified in the relation $a:na:mc$, a solid is produced in which each plane of the protopyramid is replaced by two planes (Figs. 48, 49). This solid $m \gtreqless 1$, $n > 1 < \infty$; hence there may be any number of ditetragonal pyramids. This solid bears the same relation to this system that the hexoctahedron does to the isometric system.

Open Forms.

Tetragonal Prism of the First Order, ∞P.—When the basal edges of P are modified by one plane, the axes will be cut in the relation $a:a:\infty c$, which produces simply four vertical planes (Fig. 50), these, as they are not closed, produce an open form, which is the protoprism.

Tetragonal Prism of the Second Order, ∞P∞.—When the basal angles of the protopyramid are modified by one plane in the relation $a:\infty a:\infty c$, a prism (Fig. 51) is produced similar to the protoprism, but turned 90°.

Ditetragonal Prism, ∞Pn.—When the basal angles of the protopyramid are modified by two planes in the relation

$a:na:\infty c$, a prism (Fig. 52), made up of eight faces, which are parallelograms, is produced.

Basal Pinacoid, oP.—When the axes are cut by planes in the relation $\infty a:\infty a:c$, we have simply a pair of planes parallel to the basal axes.

Pyramidal Hemihedral Forms.

The pyramidal hemihedral forms of the tetragonal system are called (1) *scalenohedral* or *sphenoidal*, (2) *trapezoidal*, (3) *pyramidal*.

(1) *Scalenohedral.*

Sphenoid of the First Order, $\pm \frac{P}{2}$.—When alternate planes of P are produced, a solid resembling a tetrahedron is formed, in which the faces are isosceles triangles (Figs. 53, 54). There will be two of these sphenoids. This solid is named after the mineral *sphene* (*litanite*), in which it frequently occurs.

Sphenoid of the Second Order, $\pm \frac{mP\infty}{2}$.—When mP∞ is treated by this law, another sphenoid is produced, similar in every respect to the sphenoid of the first order, but turned 90° (Figs. 55 and 56).

the second order, except that the basal axes terminate to one side of the center of the faces of the prism (Fig. 67).

Tetartohedral Forms.—Sphenoidal.

Tetarto-Sphenoid, $\pm \frac{r}{l}\frac{mPn}{4}$.—When mPn is modified as shown in Fig. 68, it produces a sphenoid (Fig. 69), called the sphenoid of the third order.

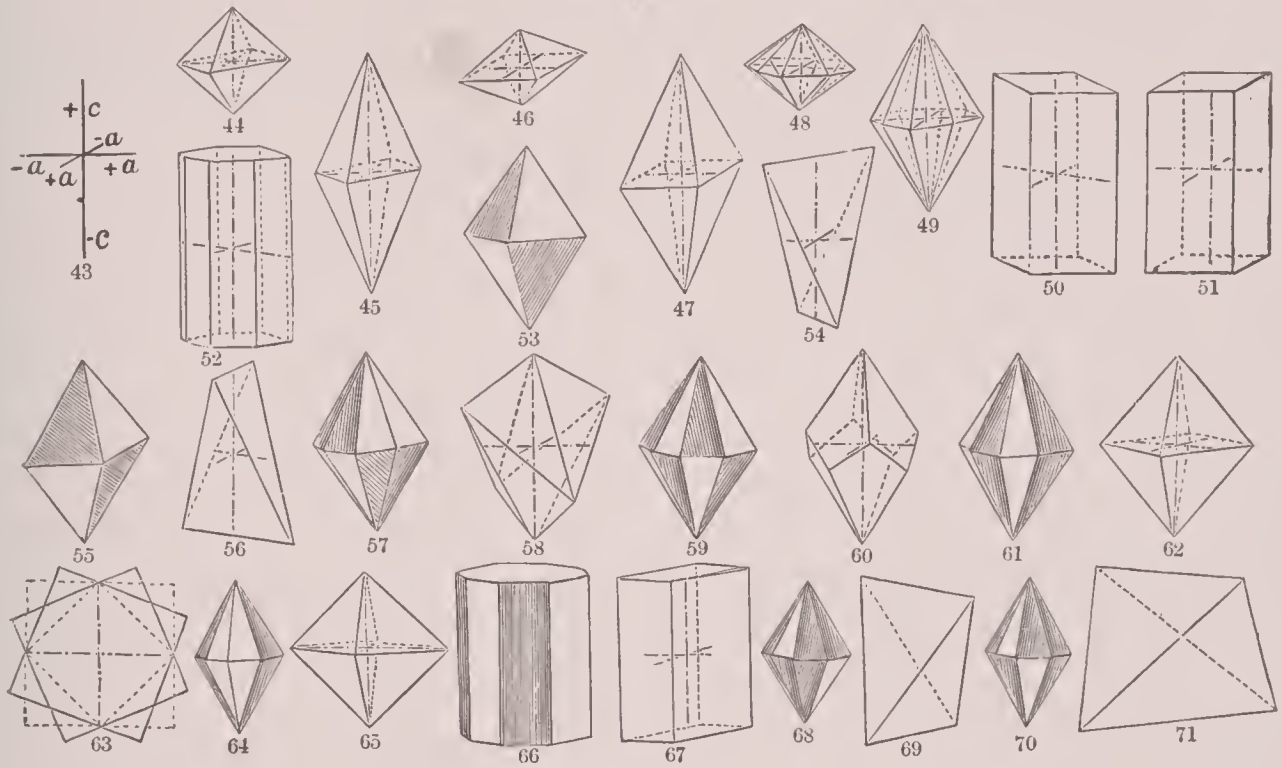
Plagio-Sphenoid.—When mPn is modified as in Fig. 70, it produces a sphenoid (Fig. 71), called the sphenoid of the fourth order. It has not been found in nature.

ORTHORHOMBIC SYSTEM.

The axes of this system (Fig. 72), a, b, c, all unequal, but all at right angles.

Holohedral Forms.—Closed Forms.

Rhombic or Protopyramid, P.—When the axes are cut in the relation $a:b:c$, the solid produced is a pyramid, whose faces are scalene triangles (Fig. 73). The planes ab, ac, and bc are rhombs of different values. As the basal axes form the diagonals of the rhombs bc, they are called, b the *macro* or *longer*, and c the *brachy* or *shorter* axis or diagonal. In each species a value of a is selected for unity, and this value is represented in P, the base of the system. The general formula will, however, be $a:b:mc$, or mP, in which $m \gtrless 1$.



Tetragonal system.

Tetragonal Scalenohedron, $\pm \frac{mPn}{2}$.—When two faces together, taken alternately above and below, of mPn are taken (Fig. 57), the solid resulting is a sphenoid, each of whose faces is replaced by two planes (Fig. 58).

(2) *Trapezoidal.*

Tetragonal Trapezohedron, r or $l\ \frac{mPn}{2}$.—When mPn is modified by taking one plane alternately above and below (Fig. 59), a solid (Fig. 60) is produced; to distinguish them from the other hemihedral forms of mPn, they are called right, r, and left, l.

(3) *Pyramidal.*

Tetragonal Pyramid of the Third Order, $\frac{r}{l}$ and $\frac{l}{r}\ \frac{mPn}{2}$.—When mPn is modified, by taking one alternate plane, but the same plane above and below (Fig. 61), a pyramid is formed which resembles the other pyramids of this system (Fig. 62). It is, however, turned to one side more or less, depending on the angle of mPn. The relations of the pyramids and prisms of the three orders are illustrated by Fig. 63. Another pyramid which is purely theoretical is formed as shown in Figs. 64 and 65.

Prismatic Hemihedral Forms.

Tetragonal Prism of the Third Order, $\frac{r}{l}$ or $\frac{l}{r}\ \frac{\infty Pn}{2}$.—When ∞Pn is modified so that only every other plane is taken (Fig. 66), a prism is produced resembling the prism of

Macropyramid, $m\breve{P}n$.—This solid (Fig. 74) resembles the protopyramid, but the symbol is $a:nb:mc$, in which $m \gtrless 1$. The macro axis has for its coefficient $n > 1$. The planes, therefore, cut the macro axis extended. The long mark ‾ through the P symbolizes this fact.

Brachypyramid, $m\breve{P}n$.—In this form (Fig. 75) the symbol is $a:nb:mc$, in which $m \gtrless 1$ and $n > 1$. The planes, therefore, cut the brachy axis extended, which is expressed by the curve ⌣ drawn through the P.

Open Forms.

Rhombic or Protoprism, ∞P.—When the basal edges of P are modified by one plane, which is parallel to the vertical axis a, according to the law $a:b:\infty c$, the resulting form is composed of vertical parallelograms (Fig. 76).

Macroprism, $\infty\breve{P}n$.—When the basal edges of $m\breve{P}n$ are modified by planes passed according to the law $a:nb:\infty c$, in which $n > 1$, the macro axis extended will be cut. The form consists of four vertical parallelograms (Fig. 77).

Brachyprism, $\infty\breve{P}n$.—When the basal edges of $m\breve{P}n$ are modified according to the law $na:b:\infty c$, in which $n > 1$ (Fig. 78), the resulting form is a prism, in which the brachy axis extended is cut.

Basal Pinacoid, oP.—When the axes are cut in the relation $\infty a:\infty b:c$, we have simply two pairs of planes.

Macrodome, $m\breve{P}\infty$.—When the terminal edges of P are

modified according to the law $a : \infty b : mc$, in which $m \gtrless 1$, the form is roof-shaped, and is called a *dome*, from *domus*, a house. The dome is always over the axis, from which it takes its name.

Brachydome, $m\breve{P}\infty$.—When the terminal edges are modified according to the law $\infty a : b : mc$, in which $m \gtrless 1$, a dome over the brachy axis is formed.

Basal Pinacoid, oP.—When the axes are cut in the relation $\infty a : \infty b : c$, planes parallel to the basal axes are produced.

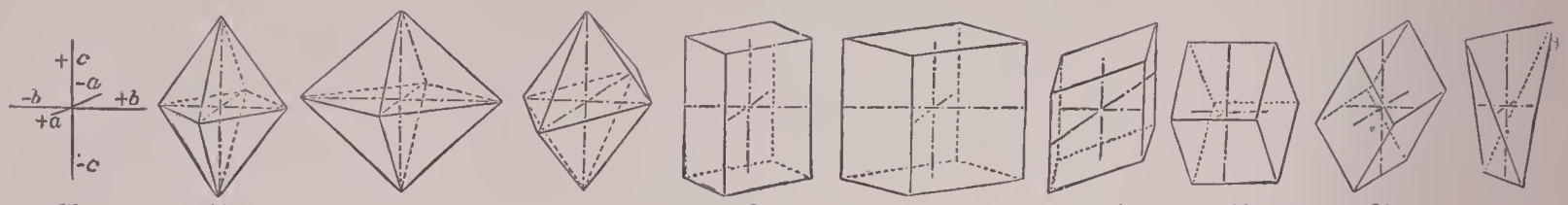
Macropinacoid, $\infty\breve{P}\infty$.—When the axes are cut according to the law $a : \infty b : \infty c$, planes parallel to the axis b are produced.

be formed by these and the other pair of planes behind above and in front below. The pyramid itself will be $\pm$ P (Fig. 83). The two planes, above in front and below behind, are by convention called $-$ P, and the others $+$ P. When m is not equal to 1, the symbol becomes $\pm m$P.

Orthopyramid, $\pm m\breve{P}n$.—When the axes are cut in the relation $na : b : mc$, the two forms produce the orthopyramid (Fig. 84).

Clinopyramid, $\pm m\breve{P}n$.—When the axes are cut in the relation $a : nb : mc$, the two forms produce the clinopyramid (Fig. 85).

Protoprism, ∞P.—When the basal edges of the protopyramid are modified, the axes are cut in the relation $a : b : \infty c$. A monoclinic prism (Fig. 86) results.



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Orthorhombic system.

Brachypinacoid, $\infty\breve{P}\infty$.—When the axes are cut according to the law $\infty a : b : \infty c$, planes parallel to the axis c are produced.

Hemihedral Forms.

The hemihedral forms of this system consist of one solid, the rhombic sphenoid, and pairs of planes or single planes.

Rhombic-Sphenoid, $\pm \frac{m\text{P}}{2}$.—When alternate planes of the protopyramid are taken, a sphenoid is formed whose faces are scalene triangles (Fig. 81).

Hemimorphic Forms.

According to the law of symmetry, when a crystal is terminated by modifications at one extremity of an axis, the same planes should be repeated at the other. In this and the hexagonal system there occur crystals where this law does not hold good, and these exceptions are called *hemimorphic* forms.

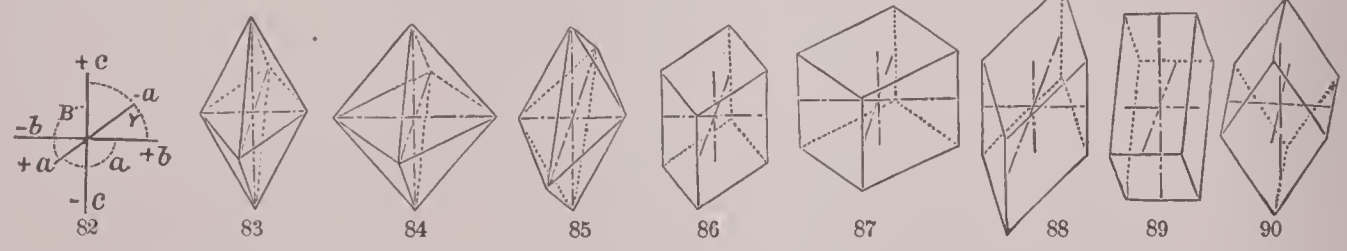
Limit Forms.

When the protoprism is accompanied by the macro and brachy pinacoids, the prism has a hexagonal section. When the angle of the prism is near 120°, forms are produced which are so similar to hexagonal combinations that it is frequently difficult, without a determination of the optical properties of the mineral, to make the distinction.

CLINOMETRIC SYSTEMS.

Monoclinic System.

The axes of this system (Fig. 82) are of three kinds, and have only a single inclination. The angle γ of the plane $ac = 90°$, the angle α of the plane $bc = 90°$, the angle β of the plane $ab \gtrless 90°$. a is called the *vertical*, b the *clino*, and c the *ortho* axis or diagonal. The plane of the basal axes is thus inclined to the vertical axis, while the ortho and clino axes are at right angles to each other.



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Monoclinic system.

Holohedral Forms.—Open Forms.

Monoclinic Pyramid, $\pm$ P.—As the axes a and b are of unequal length, and the plane which contains them makes two angles with the vertical axis, the one in front being an obtuse and the one behind making an acute angle, the relation $a : b : c$ will produce only a hemipyramid or a pair of planes, above in front or behind below. The pyramid will

Orthoprism, $\infty\breve{P}n$.—When the basal edges of the protopyramid are modified by one plane in such a way that the ortho axis extended is cut at a distance n, the relation is $na : b : \infty c$ (Fig. 87).

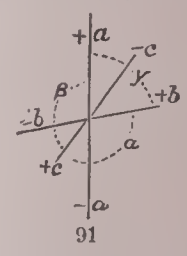
Clinoprism, $\infty\breve{P}n$.—When the orthopyramid is modified so that the clino axis extended is cut at a distance n, the relation is $a : nb : \infty c$ (Fig. 88).

Orthodome, $\pm m\breve{P}\infty$.—As the edges which join the axes a, b are of two kinds, only parallel planes will be produced by a single modification, $\infty a : b : mc$. The orthodome (Fig. 89) will therefore be made up of two hemi-orthodomes. The same convention for the signs $+$ and $-$ is made as for the pyramid.

Clinodome, $m\breve{P}\infty$.—As the edges which join the axes a, c are alike, a dome results from the relation $a : \infty b : mc$ (Fig 90).

Diclinic System.

The axes (Fig. 91) of this system are of three kinds, and have two inclinations. The angle γ of the planes $ab \gtrless 90°$, the angle α of the planes $bc = 90°$, the angle β of the planes $ac \gtrless 90°$. The basal axes are thus at right angles to each other, but the plane which contains them has two inclinations to the vertical axis.



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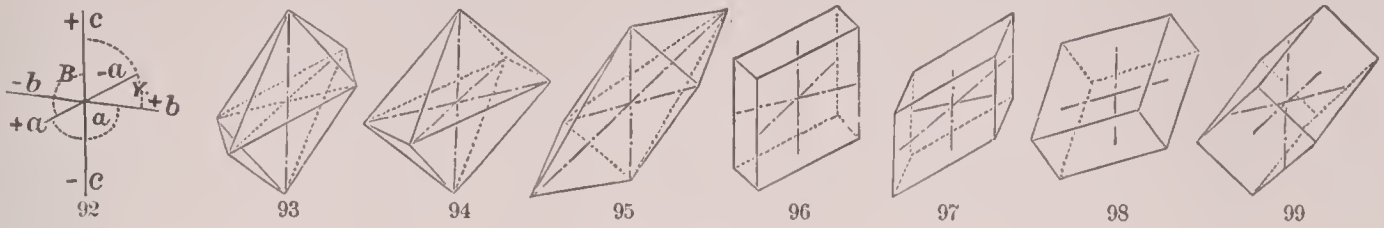
Diclinic system.

Diclinic Pyramid, $'\text{P}'$.—As the faces of the pyramid are equal only in pairs, the pyramid is made up of four tetarto pyramids. This system admits of only hemi forms and tetarto forms. a is called the vertical, b the macro, and c the brachy axis. It admits of tetarto, macro, and brachy pyramids and prisms, and tetarto, macro, and brachy domes and the pinacoids. Mitscherlich announced that he had discovered this system in a crystal of hyposulphite of lime, but subsequent crystallographic and optical researches proved that this salt was triclinic; in consequence of which the system was abandoned by most crystallographers. It has, however, the same theoretical basis as any of the other systems, and there does not seem to be any good reason why it should not be preserved.

Triclinic System.

The axes of this system (Fig. 92) are of three kinds and have three inclinations, the angles α, γ, β, are $\gtrless 90°$. The axis c is called the vertical, b the macro, and a the brachy axis.

Triclinic Pyramid, ¦P¦.—When the axes (Fig. 92) are cut in the relation $a : b : c$, a pair of planes are produced. The pyramid is made up of four tetarto-pyramids, which are distinguished by accents. P' signifies the planes right above, dihexagonal pyramid are modified by one plane, so that the axes are cut in the relation $\mu b : b : \frac{\mu}{\mu - 1} b : \infty c$, a dihexagonal prism (Fig. 106) is produced.



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Triclinic system.

'P the planes left above, P¦ the planes right below, and ¦P the planes left below, with their diagonally opposite planes. The pyramid is ¦P¦. The protopyramid (Fig. 93) will always be m¦P¦, except when m equals one, the maeropyramid (Fig. 94) is m¦P¦n, and the brachypyramid (Fig. 95) m¦P¦n.

Triclinic Prism, ∞'P'.—When the relation $\infty a : b : c$ is carried out, it produces a single pair of planes, whose symbol is ∞P' or ∞'P, according as the planes are to the right or the left. Each prism is made up of two hemiprisms. The whole form (Fig. 96) is ∞'P'. The brachyprism (Fig. 97) is ∞'P', and the macro prism ∞'P'n.

Triclinic Domes.—The domes are single pairs of planes, and each dome is made up of two hemidomes. The macrodomes are made up of m'P'∞ and m¦P¦∞ (Fig. 98), and the brachydomes of m¦P'∞ and m'P¦∞ (Fig. 99).

The only other planes are the basal pinacoid, oP, the macropinacoid, ∞P∞, and the brachypinacoid, ∞P∞.

SYSTEM WITH FOUR AXES.

Hexagonal System.

The hexagonal system is referred to four axes. One of these c (Fig. 100) is vertical. It is at right angles to the plane of the basal axes b, which are inclined to each other at an angle of 60°. The vertical is the optical axis, and is consequently the line of greatest physical as well as mathematical importance.

Holohedral Forms.—Closed Forms.

Hexagonal Pyramid, P.—When the axes (Fig. 100) are cut in the relation $\infty b : b : b : c$, the pyramid of the first order (Fig. 101), or protopyramid, is produced. In the form chosen for the base of the system the vertical axis is cut at a distance equal to unity, but it may be cut at other distances, $m \gtreqless 1$, so that the general symbol is mP. The pyramids are said to be acute or obtuse according as the terminal angle is acute or obtuse.

Hexagonal Pyramid of the Second Order, mP2.—When the terminal edges of the protoprism are replaced by one plane, so that the axes are cut in the relation $2b : b : 2b : mc$, another pyramid called the deuteropyramid (Fig. 102), which is similar in all respects to the protopyramid, except that it is turned 30° from it, is produced.

Dihexagonal Pyramid, mPn.—When the terminal edges of the protopyramid are replaced by two planes, all three of the axes b will be cut at unequal distances. If the shortest parameter is called unity or b, and the longest μb, the third parameter will have a value of $\frac{\mu}{\mu - 1} b$, and its length will be between 1 and 2. The axes will be in the relation $\mu b : b : \frac{\mu}{\mu - 1} b : mc$, or $\mu b : b : nb : mc$, in which $m \gtreqless 1$, $\mu \geqq 2$, and $n = \frac{\mu}{\mu - 1}$ (Fig. 103).

Open Forms.

Hexagonal Prism, ∞P.—When the basal edges of the protopyramid are modified by one plane which is parallel to the vertical axes, they are cut in the relation $\infty b : b : b : \infty c$, and the protoprism (Fig. 104) is produced.

Hexagonal Prism of the Second Order, ∞P2.—When the basal edges of the deuteropyramid are modified by one plane parallel to the vertical axis, a deuteroprism is produced (Fig. 105). The axes are cut in the relation $\infty a : 2b : b : 2b$. This prism is in every respect similar to the protoprism, but it is turned 30°.

Dihexagonal Prism, ∞Pn.—When the basal edges of the

Basal Pinacoid, oP.—When the axes are cut in the relation $\infty b : \infty b : \infty b : c$, the basal pinacoid is produced.

Pyramidal Hemihedral Forms.

This system admits of four different kinds of hemihedral forms, derived from its pyramids, which are called (1) *scalenohedral*, (2) *trapezoidal*, (3) *pyramidal*, and (4) *trigonal hemihedry*.

(1) *Scalenohedral.*

Rhombohedron of the First Order, $\pm \frac{m\text{P}}{2}$.—When mP is modified by producing every alternate plane (Fig. 107), the rhombohedron (Fig. 108) is produced. As there are two of them, they are designated by the signs + and −.

Rhombohedron of the Second Order, $\pm \frac{\infty\text{P2}}{2}$. — When ∞P2 is modified by the same law (Fig. 109), other rhombohedra (Fig. 110) are produced, similar to those of the first order, but turned 30°. As there is no limit to the angles of the pyramids from which they are produced, there are an infinite variety of rhombohedra. They are called acute or obtuse according as the terminal angle is acute or obtuse.

Hexagonal Scalenohedron, $\pm \frac{m\text{P}n}{2}$.—When the dihexagonal pyramid is modified, so that every two alternate faces above and below are taken (Fig. 111), the scalenohedron (Fig. 112) is produced. There are four of these scalenohedra. In order to get a clear idea of them, we have only to suppose that the terminal or basal edges of the rhombohedra were modified by two or the terminal angles by six planes.

(2) *Trapezoidal Hemihedry.*

Hexagonal Trapezohedron, r or l $\frac{m\text{P}n}{2}$.—When the dihexagonal pyramid is modified by the extension of every alternate plane above and below (Fig. 113), the hexagonal trapezohedron (Fig. 114) is produced. They are distinguished as right and left.

(3) *Pyramidal Hemihedry.*

Hexagonal Pyramid of the Third Order, $\frac{r}{l}$ or $\frac{l}{r}$ $\frac{m\text{P}n}{2}$.—When mPn is modified as in Fig. 115, a hexagonal pyramid, in which the basal axes terminate to one side of the center of the basal edges, is produced (Fig. 116), which, to distinguish it, is called the pyramid of the third order.

(4) *Trigonal Hemihedry.*

Ditrigonal Pyramid, r or l $\left[\frac{m\text{P}n}{2}\right]$.—When mPn is modified so that every alternate pair of planes, but the same planes above and below, are taken (Fig. 117), a ditrigonal pyramid (Fig. 118) is produced; to distinguish the symbol it is written in brackets.

Trigonal Pyramid of the First Order, r or l $\frac{m\text{P}}{2}$.—When mP (Fig. 119) is modified by extending every other plane, but the same plane above and below, a trigonal pyramid of the first order (Fig. 120) is produced.

Trigonal Pyramid of the Second Order, r or l $\frac{m\text{P2}}{2}$.—When mP2 (Fig. 121) is modified by the same law, a trigonal pyramid is produced.

Prismatic Hemihedral Forms.

Hexagonal Prism of the Third Order, $\frac{r}{l}$ or $\frac{l}{r}\ \frac{\infty Pn}{2}$.—When ∞Pn is modified by the extension of every alternate plane (Fig. 123), a hexagonal prism of the third order is produced.

Ditrigonal Prism, r or $l\left(\frac{\infty Pn}{2}\right)$.—When ∞Pn is modified by extending pairs of alternate planes (Fig. 125), a ditrigonal prism (Fig. 126) is produced.

Trigonal Prism of the First Order, $\pm\ \frac{\infty P}{2}$.—When ∞P is modified by the extension of every other plane (Fig. 127), a trigonal prism of the first order (Fig. 128) is produced.

Trigonal Prism of the Second Order, $\pm\ \frac{\infty P2}{2}$.—When $\infty P2$ (Fig. 129) is modified by the same law, an obtuse trigonal prism is produced (Fig. 130).

The relation of all these forms to each other is made plain by Figs. 131 and 132. Fig. 131 shows the relative positions of the hexagonal pyramids and prisms of the first, second, and third orders, and the dihexagonal pyramid and prism (Fig. 132) shows the relations of the first, second, and third orders, the scalenohedron, the trigonal and ditrigonal pyramids and prisms.

Pyramidal Tetartohedral Forms.

There are two kinds of pyramidal tetartohedry in the hexagonal system, *rhombohedral* and *trapezoidal*.

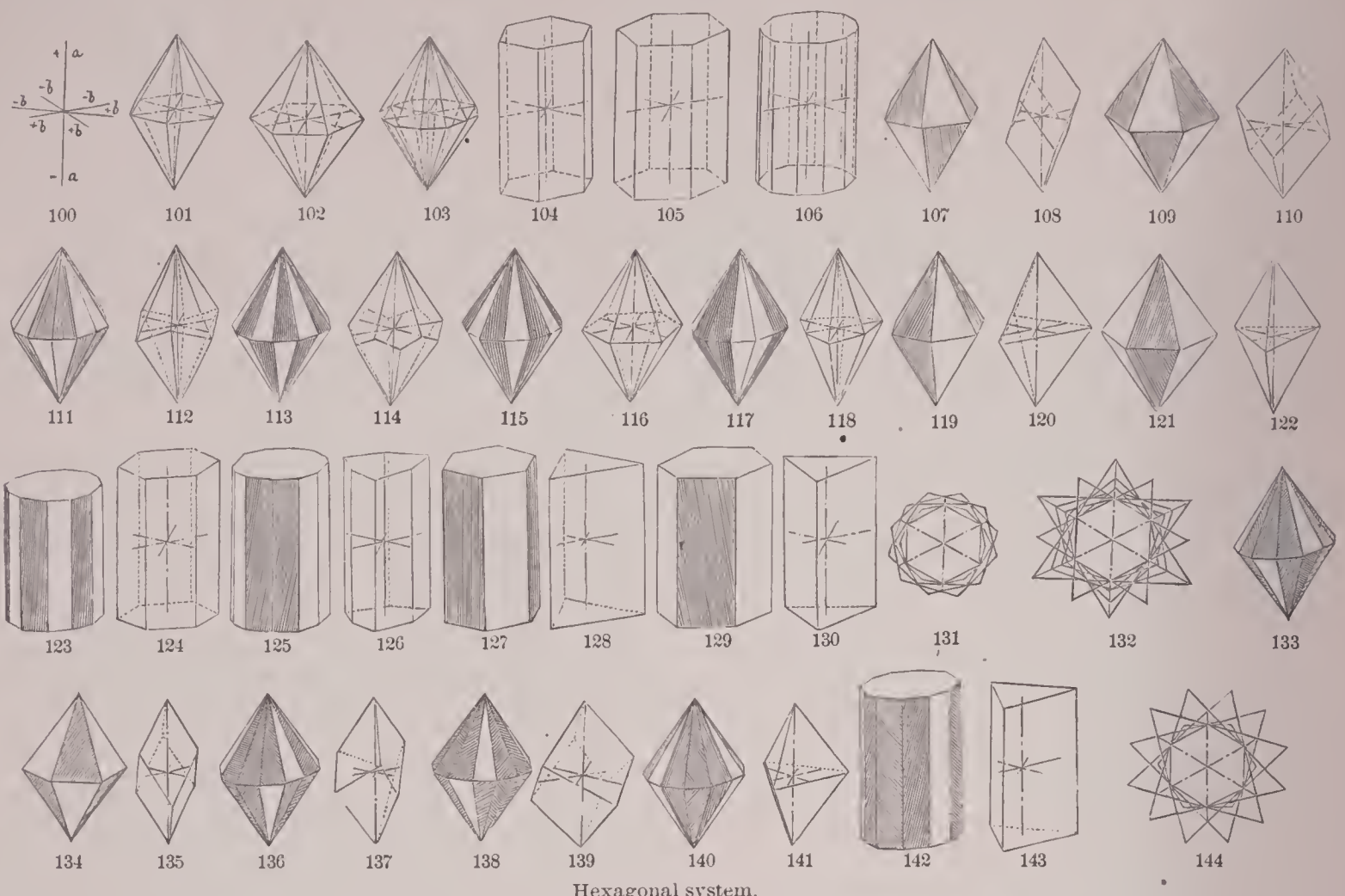
Rhombohedral Hemihedry.

Rhombohedron of the Third Order, $\pm\ \frac{r}{l}$ or $\frac{l}{r}\ \frac{mPn}{4}$.—When the dihexagonal pyramid or the hexagonal pyramid of the third order is modified as shown in Figs. 133 and 134, a rhombohedron of the third order (Fig. 135) is produced.

Trapezoidal Hemihedry.

Trigonal Trapezohedron, $\pm\ r$ or $l\ \frac{mPn}{4}$.—When mPn is modified as shown in Figs. 136 and 138, the solids (Figs. 137 and 139) are produced. These solids were formerly called plagihedra. They vary in form according as the terminal angle is acute or obtuse.

Trigonal Pyramid of the Third Order, $\pm\ r$ or $l\left[\frac{mPn}{4}\right]$.—When mPn is modified as shown in Fig. 140, a trigonal pyramid (Fig. 141) is produced.



Hexagonal system.

Prismatic Tetartohedral Form.

Trigonal Prism of the Third Order, $\pm\ r$ or $l\ \frac{\infty Pn}{4}$.—When ∞Pn is modified as shown in Fig. 142, a trigonal prism is produced (Fig. 143). The position of these tetartohedral forms is illustrated in the diagram Fig. 144, which shows the relative position of the hexagonal pyramids of the first and second orders, the dihexagonal pyramid and prism, and the trigonal pyramids and prisms of the third order.

THOMAS EGLESTON.

Crystal Palace: a structure composed mainly of iron and glass, especially that at Sydenham, near London. The first crystal palace was erected in London in 1851 from designs by Sir Joseph Paxton, and was used for the world's fair of that year. It was constructed wholly of iron and glass, except the floors, which were of wood; was 1,851 feet long, and covered 21 acres. It was taken down after the exhibition. Two years later a world's fair was held in New York in a crystal palace designed by Carstenson and Gildemeister. This was burned in 1858. The present edifice at Sydenham was built in 1854, and contains an extensive museum of art and science, besides a permanent fair, concert-halls, etc. Many similar structures have since been erected in Europe and the U. S., but the name of "crystal palace" has passed out of use except for the three historic edifices above mentioned. Revised by A. D. F. HAMLIN.

Csaba, chŏ'bŏ: a market-town of Hungary; 7 miles by rail S. S. W. of Bekes (see map of Austria-Hungary, ref. 7–J). It has a considerable trade in wine, hemp, grain, flour, and cattle. Previous to 1840 it was but a village. Pop. (1890) 34,608.

Csanad, chŏ-naad': a county of Hungary; bounded N. by Bekes, E. by Arad, S. by Torontal, and W. by Csongrad. Area, 640 sq. miles. It consists of a plain, which is very fertile, but the climate is unhealthful and the water bad. The chief products are wheat, wine, tobacco, and fruit. Chief town, Mako. Pop. (1890) 130,609.


CUBA
SCALE OF MILES
0 20 40 60 80 100
HAVANA AND VICINITY
GULF OF MEXICO
CARIBBEAN SEA
TROPIC OF CANCER
Strait of Florida
Great Bahama Bank
Old Bahama Channel
Nicholas Channel
Santarem Channel
Yucatan Channel
Gulf Stream
FLORIDA
ANDROS ISLAND
ISLE OF PINES
HAVANA
Matanzas
Cardenas
Colon
Santa Clara
Remedios
Cienfuegos
Trinidad
Sancti Spiritus
Puerto Principe
Nuevitas
Holguin
Bayamo
Manzanillo
Santiago de Cuba
Baracoa
Pinar del Rio
Longitude West from Greenwich
Longitude West from Washington
Longitude East
R.D.Servoss, N.Y.

Csongrad, chōn-graad′: a county of Hungary; bounded N. by Szolnok, E. by Bekes and Csanad, S. by Torontal, and W. by Pesth. Area, 1,280 sq. miles. The soil and products are similar to those of Csanad. It is traversed by the Theiss. Chief town, Szegedin. Pop. (1890) 262,774.

Ctenoid Fishes, tee′noid [*ctenoid* is from Gr. κτενοειδής, comb-shaped; κτείς, κτενός, comb + suffix *-oid*, based on Gr. εἶδος, appearance]: the *Ctenoidei*, an order of fishes established by L. Agassiz for those species in which the free portion of the scales bears one row, or several rows, of tooth-like points, that is, are ctenoid or pectinate. The order was the third of four in Agassiz's early classification, the others being the cycloid, the ganoid, and the placoid fishes, but it has become obsolete since the group was shown to be composed of or to contain unrelated species. The word is, however, used to describe such toothed scales. The perch, bass, and flounder are typical ctenoid fishes. F. A. L.

Ctenoph′ora [Gr. κτείς, κτενός, a comb + φέρειν, to bear]: a group of free-swimming marine animals with radiate structure, formerly included in the Radiata and more lately in the Cœlenterates. They differ from these last in many particulars which seem to warrant their separation as a distinct branch. The typical Ctenophore consists of an oval body with terminal mouth and eight-rayed stomach. Upon each of these gastric canals is placed a row of vibratile ciliated plates (the combs from which the name is derived), used in locomotion. The sexes are united in the same individual, and the reproduction is exclusively by eggs, budding being unknown. The body is transparent, and usually colorless. The shape is frequently modified by the outgrowth of ear-like lobes, and in the "Venus's girdle" (*Cestum veneris*) of the Mediterranean the body is drawn out into a ribbon some 2 or 3 feet long. Most of the species are, however, much smaller, and all are exceedingly voracious, living upon small animals which they catch by peculiar adhesive cells or by the widely open mouths. Two groups, Tentaculata and Nuda, are recognized, characterized respectively by the presence or absence of a pair of lateral tentacles. Usually the Ctenophores are included under the common name jellyfish. J. S. Kingsley.

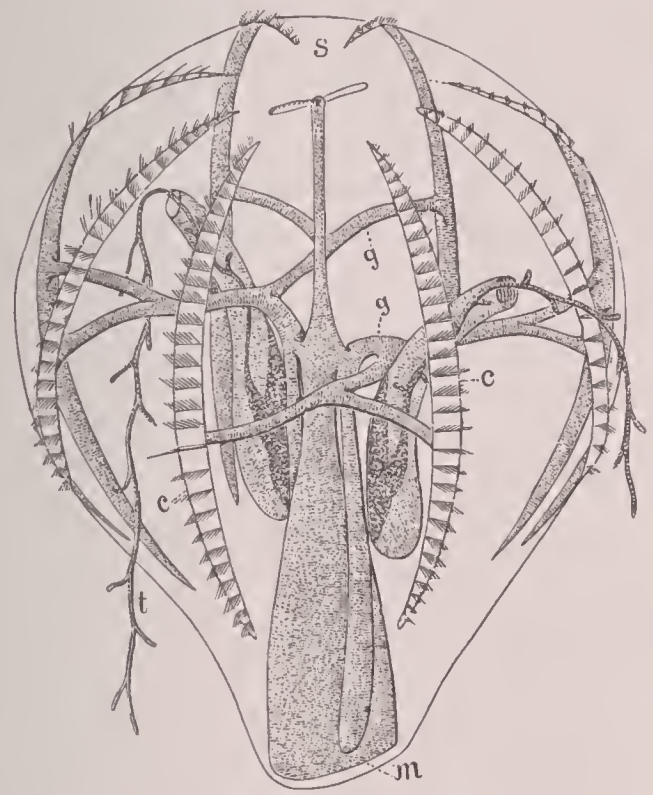


Diagram of a Ctenophore, based on Pleurobrachia; *c*, combs; *g*, divisions of stomach; *m*, mouth; *t*, tentacles; *s*, seuse organ.

Ctesias, tec′si-as (in Gr. Κτησίας): Greek historian and physician of Cnidus; spent seventeen years in the medical service of the Persian court, from 415 B. C. on. At the battle of Cunaxa he treated the wound received by Artaxerxes Mnemon. He was afterward employed in a diplomatic capacity, and returned home about 398. The results of his personal observation and his study of the native records were given in his *Persian History* (twenty-three books), composed in the Ionic dialect. An abridgment of this work, as also of his *History of India*, has been preserved by Photius, and fragments are found elsewhere. Ctesias took especial pleasure in correcting Herodotus. In antiquity he himself had a poor reputation for truthfulness, but some modern scholars have taken him more seriously. Fragments edited by C. Müller in the Didot *Herodotus* (Paris, 1844) and by Gilmore in 1891. B. L. G.

Ctesibius, tĕc-sib′i-ŭs (in Gr. Κτησίβιος): a famous Greek mechanician who flourished at Alexandria about 130 B. C. He invented a clepsydra, a pump, and other machines. He is said to have been the first who applied the elastic force of air as a motive-power.

Ctesiphon, tes′i-phŏn: an ancient city of Assyria; on the east bank of the Tigris; 20 miles S. E. of Bagdad; was the capital of the Kings of Parthia. Its ruins still attest its former magnificence. The site is now occupied by a village called Modain.

Ctesiphon (in Gr. Κτησιφῶν): an Athenian who proposed that a crown of gold should be given to Demosthenes for his public services. For this act he was prosecuted by Æschines, and defended with success by Demosthenes in his famous oration *On the Crown*, 330 B. C.

Cuanza, kwaan′zaă, or **Quanza**: the largest river of Angola and one of the most important of the secondary rivers of West Africa. Rising in Lake Mussombo, on a plateau 5,500 feet above the sea, it flows for 750 miles to the Atlantic, dropping from the highlands by a series of falls and rapids. It is navigable by steamboats from the ocean to Dondo, about 120 miles, though the bar at its mouth, where the river is 2,000 feet wide, is difficult to cross. C. C. Adams.

Cuauhtemoc′: See Guatemotzin.

Cuautla, kwaa′oot-laă, **Cuautla de Amilpas**, or **Ciudad Morelos**: principal city of the state of Morelos, Mexico; on the Morelos Railway; 85½ miles from Mexico city (see map of Mexico, ref. 8–H). It lies in a beautiful valley containing many rich sugar-plantations. The city is well laid out and clean, but there are few handsome buildings. Cuautla was an ancient Indian town. In 1812 the revolutionist Morelos abandoned it after a memorable siege. It was created a city in 1829. Pop. (1886) 14,000. H. H. S.

Cu′ba: the largest island of the Antilles, and for many years the chief colony of Spain; lying between the Caribbean Sea on the S. and the Gulf of Mexico and Bahama Channel on the N.: 130 miles S. of Florida and about equidistant from Yucatan on the W. and Haiti and Jamaica on the E. and S. E. Lat. 19° 50′ to 23° 9′ N., lon. 74° 8′ to 84° 58′ W. It is 780 miles long from E. to W., and from 25 to 130 miles wide. Its area, with adjacent small islands and Isle of Pines, is 43,220 sq. miles.

Topography and Surface.—Cuba probably had its origin in volcanic action, as demonstrated by the mountain-chain (the Copper Mountains) which traverses its whole length, Pico Turquinos, its highest summit, being about 7,750 feet. From the bases of this chain N. and S. the country expands into broad meadows, with frequent lagoons and swamps. The rivers are all small, and none of them navigable. There are good harbors with deep water at Havana, Matanzas, Puerto Principe, Santiago de Cuba, etc. Elsewhere the coasts are shallow and rocky.

Climate.—In the hills, healthful and agreeable; in the lowlands, sickly and generally hot; maximum temperature does not often exceed 88° F., but the heat is protracted, the mean of the year in the lowlands being 78°. It is a moist climate, the average annual rainfall in Havana being about 90 inches, yet some places in the interior require irrigation. There are some hurricanes and occasional earthquakes.

Resources.—Copper, with some gold, silver, iron, coal, marble, etc. There are productive copper mines in the mountains. The mountains are covered with forests of mahogany, ebony, granadilla, rosewood, cedar, live-oak, fustic, palms, and plantains. The cultivated districts yield large crops of maize, rice, yams, bananas, sugar, coffee, tobacco, cotton, and all tropical fruits, sugar and tobacco being the leading products, while immense herds of cattle are reared on the grazing lands. In 1894, a normal year before the late war, 1,054,214 tons of sugar were produced, besides a large quantity of molasses; in 1899, 335,668 tons were produced; and in 1900, 283,651 tons. The production of tobacco in 1900 was 460,000 bales. In 1899 the exports were valued as follows: Sugar, $19,337,771; tobacco and cigars, $21,082,670; fruits and nuts, $355,579; all other exports, $5,525,909; total, $46,301,929. In 1900 they were: Sugar, $16,944,811; tobacco and cigars, $26,098,688; fruits and

nuts, $729,869; all others, $6,225,903; total, $49,902,271. Of these $25,408,828 in 1899, and $31,371,704 in 1900, were destined for the U. S. The total value of the imports in 1899 was $75,303,612; in 1900, $70,644,439. In 1899 $36,773,657 were from the U. S., and in 1900 $32,269,033.

Industries.—Manufactures of sugar, molasses, rum, and cigars, preparation of coffee for market, preserving fruit, bleaching wax, and minor industries. There are 1,135 miles of railway, and 2,301 miles of telegraph line.

Government.—See CUBA in the Appendix.

Finances.—The revenue of 1899 was estimated at $26,359,650, the expenditures at $26,356,731. The approximate amount of the funded debt when the Spaniards left Cuba was $253,800,000, none of which was assumed as a charge on the Cuban people, who were released also from the additional debt of about $100,000,000 incurred by Spain in attempting to suppress the last insurrection.

Church and Education.—Roman Catholic only established religion; education was made obligatory in 1880. By the census of 1899 85,009 pupils were enrolled as attending school, with an average attendance of 54,298. There were 755 public schools, besides schools of secondary education in the towns, and a university in Havana.

History.—Island discovered Oct., 1492, by Columbus; colonized by Spaniards 1511; Indians cruelly treated by Hernando, Spanish governor, and in 1553 the entire Indian population became extinct. In 1534 and in 1554 Havana destroyed by French, but speedily rebuilt and strongly fortified in 1584; in 1624 taken by Dutch, but soon restored to Spain; from 1650 to 1700 often ravaged by filibusters; Puerto Principe plundered and destroyed by them in 1688. After 1700 Cuba prospered greatly. Tobacco monopoly established 1717, and not abolished till 1816. In 1762 Havana taken by English, but exchanged in 1763; its commercial importance rapidly increased, but it became the center of the slave-trade for Spanish America. During the prevalence of the slave-trade, 1789–1845, it is said that over 550,000 slaves were brought into Cuba. There were Negro insurrections in 1844 and 1848; more than 10,000 Negroes perished in the latter. For a great many years there was a strong pressure upon the U. S. Government, mainly from the South, to obtain possession of Cuba; President Polk offered $100,000,000 for it in 1848; in 1854 the Ostend Manifesto, signed by Buchanan, Soulé, and Mason, claimed the right to take and annex it if Spain should refuse to sell. Meantime, in 1849–51, there were insurrections, led by American adventurers. The Spanish revolution of 1868 led to an effort for Cuban independence, which continued with varying fortunes for twelve years; the war was a severe one on both sides; Cespedes was the insurgent president. A law for gradual abolition of slavery in Cuba was passed by the Cortes in 1879; in 1886 slavery was abolished absolutely. See CUBA in the Appendix.

Population and Political Divisions.—The census of 1899, taken by the U. S. War Department, shows 1,572,797 inhabitants—910,299 native whites, 142,098 foreign-born whites, and 520,400 Negroes. Cuba is divided into six provinces. The largest cities are Havana (capital), population 235,981; Santiago de Cuba, 43,090; Matanzas, 36,374; Cienfuegos, 30,038; Puerto Principe, 25,102; and Cardenas, 21,940.

Revised by MARK W. HARRINGTON.

Cubagua, ISLAND OF: See MARGARITA.

Cubas, BRAZ: Portuguese cavalier; b. about 1495. In 1536 he received from the *donotario* Martin Affonso de Souza a grant of lands in the captaincy of São Vicente, and soon after he founded a settlement there; in 1543 he endowed a small hospital in the place, calling it the Hospital de Santos; gradually this name spread to the settlement itself, now the important port and city of Santos. In 1545 Braz Cubas was named Capitão-mor, or governor of São Vicente, acting for Martin Affonso. D. at Santos in 1592.

HERBERT H. SMITH.

Cu'bature: the measurement of the volume of a solid body. If the equation to the surface inclosing the body be given in rectangular co-ordinates, its volume is expressed by the triple integral $\iiint dx\,dy\,dz$, where the integration is to be extended to all points of the solid.

Cube [from Gr. *κύβος*, cube, die]: in geometry, a solid body contained by six equal squares. It is also called a regular hexahedron, and is one of the five regular solids. It is a form which often occurs in nature, especially among crystals. In arithmetic the cube of a number is its third power, or the product obtained by multiplying that number by its square. The duplication of the cube—that is to say, the finding of a cube having double the volume of a given cube—is one of those problems which admit of no solution by the geometry of the right line and circle. On this, as on the quadrature of the circle and the trisection of an angle, a vast amount of ingenuity has been vainly expended since the dawn of mathematical science. The solid contents of a cube are equal to the third power of the number which expresses the length of one of its sides.

Cubeb [Fr. *cubebe*, Span. *cubeba*, from Arab. *kabābah*, an aromatic berry]: the dried, unripe fruit of the *Cubeba officinalis* (and probably of other species), climbing woody plants belonging to the order *Piperaceæ*. The cubeb vine resembles that which produces the ordinary black pepper. Cubebs are brought chiefly from Java, Penang, etc., and are used as an aromatic and stimulant diuretic. Their active properties depend on the volatile oil which they contain. They also have a crystallizable principle called "cubebin," and a balsamic resin. The oil, tincture, and extract are used in medicine.

Cube Root: See ROOT.

Cubic Equation: an equation which involves the cube of the unknown quantity. A *pure* cubic equation contains only two terms; as e. g. $x^3 = 27$; all others are said to be adfected; as e. g. $x^3 - 5x^2 + 4x + 7 = 1$.

Cubic Niter: See SALTPETER, CHILI.

Cubit [from Lat. *cubitus*, elbow, ell > Fr. *coude*: Ital. *cubito*]: a linear measure of the ancients, equal to the length of a man's arm from the elbow to the tip of the middle finger. It is generally stated to be 18 English inches. The ancient Egyptian cubit, or "cubit of Memphis," was about 20·7 British inches. The mean of Sir Isaac Newton's determinations, from the careful measurements of the great pyramid by Prof. John Greaves (published in 1737), made it 20·672. The mean of still more careful measurements by Prof. C. Piazzi Smyth in 1865 made it 20·73. According to Newton, the cubit of Babylon was very nearly 24 British inches; the royal cubit of Persia, 21·195 inches; the cubit of the Romans, 17·406 inches; the cubit of the Greeks, 18·1308 inches; the Egyptian cubit in use in 1737, 21·888 inches; the sacred cubit of Moses he calculates to have been not greater than 24·9389 inches, nor less than 24·7262, and its probable value to have been 24·7552 inches. Prof. Piazzi Smyth thinks that he has proved that the unit of measure employed by the builders of the Great Pyramid in laying out the ground-plan of their work was identical with the sacred cubit of Moses, and that its value was 25·025 British inches; which is, according to the most recent determinations, almost exactly the 10,000,000th part of the earth's polar radius. He supposes, therefore, that this unit of measure, which was divinely given, was made by divine intention to be in this exact decimal relation to the invariable line around which the earth revolves. If the British inch be increased by $\frac{1}{1000}$th part, it becomes what Prof. Smyth calls a "pyramid-inch"; and a pyramid-cubit, or sacred cubit, is 25 pyramid-inches, or $\frac{1}{10000000}$th part of the earth's polar radius. Prof. Smyth maintains his hypothesis with much ingenuity, but it has not been generally received with favor.

The value of the biblical "cubit of a man" is extremely uncertain. Dr. William Smith, in his *Dictionary of the Bible*, has discussed the question pretty fully, and inclines to regard it as having had a value, deduced by Thenius (*Theologische Studien und Kritiken* for 1846) from the Egyptian cubit measure preserved in the Turin Museum, of 23 digits, each digit being 0·7938 British inch = 18·257 British inches.

Cuchan Indians: See YUMAN INDIANS.

Cuckoo: a bird of the genus *Cuculus*, and allied genera, belonging to the family *Cuculidæ*. The family is represented in temperate and tropical regions throughout the world, and comprises birds of great diversity of size and plumage. Aside from certain anatomical characters, they agree in having the fourth outer toe turned backward like the parrots, although they are not climbers. Many of the species have the habit of making no nest, depositing their eggs in the nests of other and smaller birds. The most noted among them is the European cuckoo (*Cuculus canorus*), which breeds throughout Europe and a great part of Asia, retreating south in winter, the European birds migrating to Africa. It is a little over a foot in length; the greater part of the plumage is ashy gray, but the under side is grayish

with black bars; the wings and tail are black, the latter with white spots. The cuckoo frequently places her eggs in nests so situated that she can not sit upon them, accomplishing this by depositing the egg upon the ground and transferring it to the nest with her mouth. The young cuckoo either crowds, or deliberately throws out, the eggs or young of its foster parents, and thus secures their individual care.

The European cuckoo.

The coucals, or ground cuckoos, of the genus *Centropus*, are large species, characterized by a long, straight claw on the inner toe. They are found from Africa, eastward to Australia, are poor flyers, but run well, frequenting thick underbrush and feeding upon small reptiles, insects, eggs, etc. They nest upon the ground and raise their own young. The golden cuckoos, *Chrysococcyx*, are small birds whose plumage, like that of humming-birds, glows with metallic greens and coppery red. They inhabit the warmer portions of Africa, Asia, and Australia, one species regularly migrating from Australia to New Zealand and back. The giant of the family is the Australian channel-bill (*Scythrops novæ-hollandiæ*), a bird 2 feet in length, with a large bill, and plumage rather resembling that of its European relative, whom it is also said to resemble in depending upon other birds to raise its young. The common cuckoos of the U. S. are the yellow-billed (*Coccyzus americanus*) and black-billed (*Coccyzus erythrophthalamus*), both found from the Rocky Mountains eastward, the first also occurring on the Pacific coast. They are both satiny, olive gray above, white below, with long tails tipped with white. Aside from the difference in the color of the bills, the black-billed cuckoo is slightly the larger of the two, has less cinnamon color in its wings and less white in the tail. They build flimsy nests of twigs, and lay four or five pale greenish-blue eggs.

The road-runner, or chapparal cock (*Geococcyx californianus*) is a large cuckoo found in Southern California, New Mexico, and the adjacent region. It is so named from the rapidity with which it runs, its speed on foot being some compensation for feeble powers of flight. Like many other cuckoos, this one deposits its eggs at considerable intervals, so that by the time the last is hatched the first born is half the size of the parents. Lastly, there are a few American cuckoos of the genus *Crotophaga*, known as anis, characterized by dark plumage and deep, sharply ridged bill, which either build a separate nest or club together in parties of four or five and build a common nest, in which as many as twenty eggs may be deposited. They inhabit the warmer parts of America, from Texas and Florida southward.

F. A. Lucas.

Cucumber [M. Eng. *cucumer*, from Lat. *cu'cumis, -eris*]: *Cucumis sativus*, one of the *Cucurbitaceæ*; cultivated from the earliest times, and supposed to have come from India. It is closely allied to the musk-melon, and it is commonly supposed that the two species will cross or mix, but this notion is unfounded. The so-called snake cucumber belongs to *Cucumis melo*, the musk-melon species. There are about seventy varieties of cucumbers offered by American seedsmen. The so-called English or forcing varieties differ from the common kinds chiefly in their greater length—often reaching 30 inches—larger leaves and flowers, and the readiness with which they grow in glass houses. These are much prized in England, and deserve a greater popularity here. The cucumber demands a rich warm soil. It is quickly injured by frost, and should not be planted in the field until all danger of cold is past. Small cucumbers are extensively used as pickles, the smallest varieties being called gherkins. The term gherkin is often applied to the species *Cucumis anguria*, the burr or West Indian cucumber. This is a very different plant from the common cucumber, producing a small prickly short-oblong fruit. It is not generally grown.

L. H. Bailey.

Cucumber Family, the *Cucurbitaceæ*: See Gourd Family.

Cucumber-tree, or **Mountain Magnolia**: a fine North American tree (*Magnolia acuminata*), attaining a height of 60 to 90 feet, with a stout trunk, 3 to 4 feet in diameter, covered with furrowed, dark-brown, scaly bark. The leaves are deciduous, ovate or nearly so, and are from 7 to 10 inches long and from 4 to 6 inches broad; when young they are downy, but when mature they are smooth and deep green. The pale-yellow flowers are about as large as a tulip and of nearly the same shape. They have three acute membranaceous sepals and six obovate pointed petals in two rows, the outer broadest. The short stamens are very many, arranged in many ranks upon the lower part of the receptacle. The very numerous simple pistils cover the elongated receptacle, and form a fleshy mass which bears some resemblance to a small cucumber, which has suggested the common name of the tree. At maturity the ripened pistils split open along their dorsal sutures, and permit the solitary, bright-red seeds to drop out, where they remain suspended for some time by a slender thread consisting of the unrolled spiral vessels of the seed stalk. The wood of this tree has been used for making water-pipes, troughs, etc. C. E. B.

Cucur'bita: See Pumpkin.

Cucuta, or **San José de Cucuta**, saan'*kh*ō-sā'dā-koo'kootaă: a town of Santander, Colombia; second in order of size; situated in lat. 7° 50′ N.; close to the Venezuelan border; about 1,200 feet above the sea. It is connected by rail with the Zulia river, a distance of 35 miles northward. Pop. 10,000.

Cudbear [corruption of *Cuthbert*, from Dr. Cuthbert Gordon, who, about 1777, introduced the manufacture at Leith]: one of the forms in which the dye archil comes into the market. It forms a reddish powder. It is obtained indirectly from a number of lichens that are found on the coasts of the Azores, the Canary and Cape Verd islands, and elsewhere. The substances actually obtained from the lichens are colorless acids known as erythric and lecanoric acids. These can be transformed in a compound called orcinol, which when subjected to the action of the air and ammonia is changed to a purple compound called orceïn. Litmus is obtained from the same lichens by a somewhat different process.

Cud'dalore: a maritime town of Hindustan; in Arcot, and on the Coromandel coast; 86 miles S. of Madras. It is one of the most populous towns in the south of India (see map of S. India, ref. 6–F). It has a custom-house, and a port from which cotton goods are exported. It was taken from the British by the French in 1758, but finally ceded to them in 1785. Pop. (1891) 47,355.

Cud'dapah, or **Kadapa**: division and town of Madras, British India. The division is an irregular parallelogram, lying between the parallels 13° 12′ and 16° 19′ N., and the meridians 77° 52′ and 79° 48′ E. lon. It is divided into two nearly equal parts by the eastern ghats, the eastern part being a low-lying plain, the western a table-land 1,500 to 2,500 feet above sea-level. The drainage is through the Penaur river, which fluctuates greatly with the season. The total area is 8,745 sq. miles. Pop. 1,150,000, nearly all Hindus. The capital is Cuddapah, a station on the railroad from Madras, near the Penaur river (see map of S. India, ref. 5–E). Pop. about 20,000, two-thirds Hindus.

M. W. H.

Cudweed: any plant of *Gnaphalium*, *Antennaria*, and *Filago*, belonging to the family *Compositæ*. They are covered with a woolly down; have sessile or decurrent leaves and tubular flowers. The childing cudweed, *Gnaphalium germanicum*, throws out shoots from its base like a family of children. Some cudweeds are used as diaphoretics in domestic medicine.

Cudworth, Ralph, D. D.: philosopher and divine; b. at Aller, in Somersetshire, in 1617; son of Ralph Cudworth, chaplain to James I. He graduated at Emmanuel College, Cambridge, and became fellow and tutor 1639; master of Clare Hall in 1644; and Professor of Hebrew in 1645. In 1654 he was chosen master of Christ's College, and in 1678 was appointed prebendary of Gloucester. In theology he was a "latitudinarian." His great work *The True Intellectual System of the Universe* (1678) displays great learning, liberality, and independence of mind. He favored the Platonic philosophy, although in physics he adopted the corpuscular theory. D. at Cambridge, June 26, 1688, leaving a *Treatise Concerning Eternal and Immutable Morality*, published in 1731. A number of his unpublished manuscripts are in the British Museum. His daughter became Lady Masham and a friend of John Locke. See J. Tulloch, *Rational Theology*; J. Martineau, *Types of Ethical Theory*, vol. ii.; and his *Life* by T. Birch in the edition of his *Works* (1820, 4 vols.). Revised by S. M. Jackson.

Cuenca, kwen'kăă: province of Spain; in New Castile; drained by the rivers Tagus and Jucar. Area, 6,726 sq. miles. The surface is partly mountainous; coal, copper, iron, and silver are found here. Pop. (1887) 242,024.

Cuenca: city of Spain; capital of province of same name; on a hill nearly 3,000 feet high, rising from the Jucar; about 85 miles E. S. E. of Madrid (see map of Spain, ref. 16–G). It has a richly adorned cathedral and several convents. It was once noted for its silver manufactures. It suffered much during the Peninsular war, and was sacked by the Carlists in 1874. Pop. (1887) 9,747.

Cuenca: city of South America; in Ecuador; capital of the province of Cuenca; on table-land 8,640 feet above the level of the sea; 189 miles S. of Quito, after which it is the most populous city of Ecuador (see map of South America, ref. 3–B). It has a cathedral and a university; also several sugar-refineries, woolen-mills, and potteries. Pop. 25,000 to 30,000.

Cuernavaca, kwār-năă-vaa'kăă: an attractive city of Mexico; capital of Morelos; about 25 miles W. of Popocatepetl; elevation 5,380 feet, according to Humboldt (see map of Mexico, ref. 8–H). It was captured by the Spaniards in 1521, and was a favorite winter resort for both Cortés and Maximilian. Cortés's palace is now a court-house, and Maximilian's villa a school-house. About 6 miles S. are extensive sugar-mills. The town is connected by rail with the city of Mexico. Pop. 8,500.

Cuero, kwā'rō: town; on railway; capital of Dewitt co., Tex. (for location of county, see map of Texas, ref. 6–I); situated 2 miles from Guadalupe river; has public schools, three cotton-gins, cotton-seed oil mills, etc. Pop. (1880) 1,333; (1890) 2,442; (1900) 3,422.

Editor of "Bulletin."

Cuervo, kwār'vō, Rufino José: Spanish-American scholar; b. in Bogotá, Colombia, Sept. 19, 1844. For some years he has lived mainly in Paris. He published in 1872 *Apuntaciones críticas sobre el lenguage Bogotano*. He has published a critical edition of the *Gramática castellana* of Andrés Bello (1890). At present he is at work upon a dictionary of the Spanish language, after the model of the famous French dictionary of Littré, *Diccionario de construcción y regimen de la lengua castellana* (t. i., 1886). A. R. Marsh.

Cuestrin', or **Kustrin**: a fortified town in Prussia; province of Brandenburg; at the confluence of the Oder and Warthe; 52 miles E. of Berlin (see map of German Empire, ref. 3–G). It consists of the town proper, situated within the fortifications and forming a fortress of first rank, and two suburbs, one on the left bank of the Oder and one on the right bank of the Warthe. It is surrounded by marshes. The Oder is crossed by a bridge 900 feet in length. Pop. (1890) 16,672.

Cueva, Baltazar, de la: Spanish statesman; b. in Madrid, 1626. He was a younger son of the seventh Duke of Albuquerque, and became Count of Castellar and Marquis of Malagon by marriage. He graduated in law at Salamanca, and held important judicial posts; was councilor of state and afterward of the Indies, ambassador to Germany, and in 1673 was named Viceroy of Peru, Tierra Firme, and Chili. He entered Lima Aug. 15, 1674. During the four years of his term he paid especial attention to the finances, and remitted large sums to Spain. Peru at this time was regarded only as a means of enriching Spain, and the viceroys were constantly hampered by demands for money; notwithstanding this drain the Count of Castellar did much for the people, and especially legislated in favor of the Indians. In 1674 he ordered that Araucanian Indians taken in war should no longer be held as slaves. He also tried to relax the severe Spanish monopolies on commerce; but this caused an outcry from the merchants, and in July, 1678, the viceroy was ordered to turn over the government to the Archbishop of Lima, and to reside in Paita until the charges against him were tried. The sentence of the court, given after nearly two years, exonerated the viceroy, but pronounced for the continuance of the monopolies. The Count of Castellar then returned to Spain, and resumed his post as councilor of the Indies, which he held until his death at Seville, 1686. Herbert H. Smith.

Cueva, Francisco Fernandez de la: See Fernandez de la Cueva.

Cuevas de Vera, kwā'văăs-dā-vā'răă: town of Spain; in Granada; on the river Almanzor at its entrance into the Mediterranean; 42 miles N. E. of Almería (see map of Spain, ref. 19–H); has important silver mines. Pop. (1887) 20,027.

Cufic Writing [so named from the town of Cufa or Koofa (Syr. *Akula*) on the Euphrates]: one of the most ancient forms of Arabic writing, supposed to have been introduced into Arabia a short time before the period of Mohammed. It was in common use till the tenth century, and afterward was confined to coins and inscriptions.

Cui, Cesar Antonovitch: See the Appendix.

Cuichunchulli: a plant of the genus *Ionidium*, of the Violet Family (*q. v.*), reputed to have great medicinal value. There is some confusion as to the name of the species, some authorities citing it as *I. marcucci*, others *I. parviflorum*, and still others *I. glutinosum*. It is used as a remedy for elephantiasis, and is also emetic and cathartic. C. E. B.

Cuirass' [from O. Fr. *cuirace*: Ital. *corazza*: Span. *coraza* < Lat. adjec. *coriā'ceus*, *-ā*, leathern, deriv. of *corium*, leather]: armor for the body from waist to neck; made of hammered metal in large pieces, usually one breast-plate and one back-piece secured together by straps, and known as a pair of cuirasses. The breast-plate alone is sometimes called the cuirass. See Armor.

Cuirassiers: heavy cavalry wearing the cuirass and helmet. They are a survival of the troopers of the sixteenth and seventeenth centuries who wore a similar protection. There are in the German army twelve cuirassier regiments, the cuirass being of white metal with brass plate; in the French army twelve regiments wearing steel cuirasses with brass plates; in the Russian army four with iron cuirasses covered with a thin layer of copper. In the British army the Life Guards and the Royal Horse Guards received steel cuirasses in 1821, but do not wear them in active service.

Cuitlahuatzin, or **Citlahuatziu**, kĕĕt-lăă-wăăt-zeen': a younger brother of the Aztec sovereign of Mexico, Montezuma II.; b. about 1470. On the approach of Cortés in 1519 he advised resistance, but was disregarded. After the seizure of Montezuma by Cortés he plotted with Cocama and others to effect his release; but the confederates disagreed among themselves, and for a time Cuitlahuatzin himself was in the power of the Spaniards. At the request of Montezuma, Cortés released him. The Aztecs welcomed him as a liberator, and he consented to lead them, directing the assault on the building where the Spaniards were quartered, and against the causeway during the retreat of the *Noche Triste* (June 30, 1520), Montezuma being now dead. Cuitlahuatzin was elected sovereign, but not without resistance and tumult, in which four princes, brothers and sons of Montezuma, perished. His installation was celebrated with the usual human sacrifices, in which the Spaniards who had been captured on the *Noche Triste* were slain. Less than three months afterward he died in the pestilence which swept over Mexico (about Sept., 1520).

Herbert H. Smith.

Cujas (in Lat. *Cujacius*), Jacques: French jurist; b. at Toulouse in 1522. He learned Greek and Latin without

a teacher, studied law at Toulouse, and became in 1577 Professor of Law at Bourges. His lectures on the *Institutes* attracted students from all the countries of Europe. He developed a reform in modern law inaugurated by Alciat. The Roman law received a thorough interpretation from him, and according to its principles, which had until then been adopted partially as expediency suggested, the doctrine of the law was fundamentally renovated. He had in his library 500 manuscripts of the Justinian laws. His works (1st ed. 1577; complete ed. Fabrot, 1658, 10 vols.) have been often reprinted. D. at Bourges, Oct. 4, 1590. See Papire Masson, *Vie de Cujas*, 1590; Bernardi, *Éloge de Cujas*, 1775; Spangenberg, *J. Cujas und seine Zeitgenossen*, 1822.

Culdees', or **Kildees**: a name first used in the eighth century as the designation of an order of Celtic ecclesiastics chiefly found in Scotland and Ireland. Some historians claim that the Culdees were Celtic missionaries of the sixth and subsequent centuries, who carried the gospel to Scotland and other countries. Some of the Culdees were monks, others were free from monastic discipline. Communities of Culdees existed in Armagh, Ireland, until the time of the Reformation, and were resuscitated in 1627, but had only a brief existence. See Skene, *Celtic Scotland*, vol. ii.

Cul-de-sac [Fr., bottom of the bag; *cul* : Ital. *culo* < Lat. *cū'lus*, anus]: a street or alley open at one end only; sometimes called a blind alley. Also, in natural history, in buildings, in topography, and in military language, the term is used in an analogous sense for a passage with only one outlet.

Culenborg, or **Kuilenborg**, koo'len-bōrkh: town in the province of Gelderland, Holland; 6 miles N. N. W. of Tiel; on the Leck (see map of Holland and Belgium, ref. 6–G). It is surrounded by a wall, and has manufactures of furniture, stoves, etc., and a trade in corn. Pop. (1890) 7,630.

Culiacan': a town of Mexico; capital of Sinaloa; on the river Culiacan; 36 miles from its mouth (see map of Mexico, ref. 4–E). It is a handsome Spanish town with many wealthy inhabitants, and has numerous silver mines in the neighboring sierra. It is connected with its port, Altata, by a railway. The largest building is a mint built by English engineers. Pop. about 10,000.

Culil'awan or **Culilawang Bark**, called also **Clove Bark**: a valuable pungent and aromatic bark; obtained from *Cinnamomum* or *Laurus culilawan*, a tree which grows in the Molucca islands. The decoction is useful in diarrhœa and indigestion.

Cullen, William, M. D.: British physician; b. in Lanarkshire, Scotland, Apr. 15, 1712. He acquired his profession amid great embarrassments. In 1756 he obtained the chair of Chemistry in Edinburgh, where he practiced medicine with success. He published *First Lines of the Practice of Physics* (1777), his chief work, in which novel pathological theories are propounded, and which was translated into all European languages; a *Synopsis of Methodical Nosology* (in Latin, 1785); a *Treatise of the Materia Medica*, in which numberless errors were dispelled (1789); and other works. D. Feb. 5, 1790. See Dr. John Thomson. *Life and Writings of William Cullen* (1832). This biography was completed by Dr. Craigie in a second volume, 1859.

Cullera, kool-yā'raă: seaport-town; province of Valencia, Spain; on the Mediterranean; at the mouth of the Jucar, 24 miles S. S. E. of Valencia (see map of Spain, ref. 17–I). Grain, wine, and fruits are exported, and the fisheries are extensive. Pop. (1887) 11,713.

Cull'man: town (founded 1873); capital of Cullman co., Ala. (for location of county, see map of Alabama, ref. 2–C); on L. and N. R. R., 33 miles S. of Decatur, Ill., and 53 miles N. of Birmingham; has 7 churches, 6 schools, furniture and wagon factories, and other small industries; fruit-growing and the raising of grapes are flourishing industries. Pop. (1880) 426; (1890) 1,017; (1900) 1,255.

Editors of "Tribune."

Cullo'den, also called **Drummos'sie Moor**: a battle-field of Scotland. It is an elevated table-land, now well cultivated, in Inverness-shire, 6 miles E. N. E. of Inverness. Here the royal army, commanded by the Duke of Cumberland, totally defeated the Young Pretender, Apr. 16, 1746.

Cullom, Shelby Moore: lawyer; b. Nov. 22, 1829, in Wayne co., Ky.; taken by his father to Illinois the following year; received an academic education at Rock River Seminary, Mt. Morris, Ill.; went to Springfield, 1853, to study law, and has since resided there; admitted to the bar 1855; member of Illinois Legislature 1856, 1860, 1872, 1874; Speaker of the Illinois house 1861 and 1873; member of Congress from Illinois 1865–71; Governor of Illinois 1876, and re-elected, but resigned in 1883, having been elected to the U. S. Senate; re-elected senator in 1888 and 1894; delegate to National Republican conventions, and nominated Gen. Grant in 1872; candidate for Republican nomination for President 1892. Senator Cullom is the author of the interstate commerce law, and has been chairman of the interstate commerce committee of the Senate for a number of years.

C. H. Thurber.

Cul'lum, George W.: U. S. military officer; b. Feb. 25, 1809, in New York city; graduated at West Point in 1833; colonel of engineers May 7, 1867, and brigadier-general of volunteers Nov. 1, 1861. He superintended the construction of many forts and public works; was instructor of practical military engineering at West Point 1848–55. In the civil war he was A. D. C. (rank of colonel) to Lieut.-Gen. Scott, general-in-chief 1861; chief of staff and of engineers to Maj.-Gen. Halleck while commanding the departments of Missouri and Mississippi, and general-in-chief of the armies of the U. S. 1861–64; engaged in establishing defensive works; organized the defenses of Nashville, Tenn., the great dépôt of supplies for Western armies; superintendent of the U. S. Military Academy 1864–66; brevet colonel, brigadier-general, and major-general Mar. 13, 1865; mustered out of volunteer service Sept. 1, 1866; member of the board of engineers for fortifications 1866. Was author of *Military Bridges with Indiarubber Pontons* (1849); of *Register of the Officers and Graduates of the United States Military Academy* (1850); of *Systems of Military Bridges* (1863); of a *Biographical Register of the Officers and Graduates of the United States Military Academy* (1868 and 1890); translator and editor of Duparcq's *Elements of Military Art and History* (1863). Retired from active service Jan. 13, 1874. D. in New York city, Feb. 28, 1892, leaving a large part of his fortune by will for the erection of a memorial hall at West Point, and for continuing the publication of the *Biographical Register of the Officers and Graduates of the United States Military Academy*.

Revised by James Mercur.

Culm [from Lat. *culmus*, stalk]: in botany, the peculiar cylindrical hollow and jointed stem of the grasses. Culm is also a popular name given in some parts of England to anthracite coal. It is also common throughout the British islands in the sense of "coal-dust," or "slack."

Culmination [from Lat. *culmina're*, reach highest elevation, deriv. of *culmen, cul'minis*, peak]: in astronomy, the passage of a celestial body over the meridian at the upper transit. The sun culminates at noon or midday, and the full moon culminates at midnight, 12 P. M. The term is also applied to the transit of a circumpolar star over the meridian below the pole. It is then called the lower culmination.

Cul'peper: capital of Culpeper co., Va. (for location of county, see map of Virginia, ref. 5–G); on Rich. and Dan. R. R., 69 miles S. W. of Washington, D. C.; has a private school for girls, and industries in gold-mining, stock-raising, and agriculture. Pop. (1880) 1,613; (1890) 1,620; (1900) 1,618.

Editor of "Exponent."

Culpeper, Thomas, second Lord: one of the persons to whom Charles II. granted the territory of Virginia in 1673. He was the Governor of Virginia from 1680 to 1683. D. in 1719. This name in the baronage of England is written Colepeper.

Culross': seaport-town of Perthshire, Scotland; on the north shore of the Firth of Forth, 22 miles N. N. W. of Edinburgh (see map of Scotland, ref. 11–H). The monastery of St. Serf was founded here about the sixth century. Culross, which was successively the seat of the Elgin and Dundonald families, has remains of a Cistercian abbey, founded in 1217. Pop. 380.

Cultivator: an agricultural implement used in the U. S. before planting crops, and for loosening the earth between rows of plants. In Great Britain the general name for such an implement is grubber. Cultivators are usually either triangular or rectangular frames, with handles like those of a plow, a greater or less number of plow-like teeth, and with their center-beams projecting in front for the attachment of wheels and draught clevises. Cultivators are very extensively used and manufactured in the U. S.

Cult Societies: See INDIANS OF NORTH AMERICA.

Culturkampf: See KULTURKAMPF.

Culverin [Fr. *couleuvrin*, adder-like, deriv. of *couleuvre*, adder, O. Fr. *culuevre* : Span. *culebra* : Portug. *cobra* < Lat. *co'lubra*, adder]: a cannon belonging to the earliest days of artillery. In the sixteenth century it was the heaviest gun used, throwing a shot of 15 lb. weight.

Culvert [viâ O. Fr. from a deriv. of Lat. *cola're*, cleanse, > Fr. *couler*]: a channel for carrying water underneath a roadway, embankment, or canal. Where stone is scarce they are made of timber, and are rectangular in section. Masonry culverts of less than 20 sq. feet waterway are also usually rectangular, and are called box culverts. Larger ones are built with the upper surface arched, and are called arch culverts, the largest ones having spans of about 20 feet. Pipes of vitrified clay and of cast iron are now much used for small culverts. In order to avoid injury to the embankments by high water, the ends of the culvert are usually provided with wing walls. A box culvert 3 by 4 feet and 25 feet long costs nearly $200, while an arch culvert of 12 feet span and 25 feet length, with wing walls, costs about $1,200. For full details, see Baker's *Masonry Construction* (1890). MANSFIELD MERRIMAN.

Culverwell, NATHANAEL: Platonist; b. in Middlesex; entered Emmanuel College 1633; B. A. 1636; M. A. 1640; elected fellow 1642. D. before 1651. Author of *Light of Nature*, a work of great power and learning (new ed. 1857).

Cu'mæ: an ancient and famous Greek city of Campania, situated on the Mediterranean, 11 miles W. of Naples. It was founded conjointly by colonists from Chalcis in Eubœa and Cyme in Asia Minor. According to Strabo, it was the most ancient of the Greek colonies in Italy. It became an opulent commercial city, built several harbors or port-towns—among which was Neapolis, the present Naples, which has outlived the mother-town—and for a period of 200 years (700–500 B. C.) it was the most important city of Southern Italy. The people of Cumæ waged war against the Etruscans, who disputed their supremacy as a maritime power, and for a time they were successful. But eventually it proved impossible for the Greek colonies in Italy to maintain themselves against the rising power of the native states. Cumæ was conquered by the Samnites in 417 B. C., and became a Roman *municipium* in 338. In the second Punic war Hannibal tried to capture it, but failed. Cumæ was famous as the residence of the SIBYL (*q. v.*). It was the last stronghold of the Goths in Italy, and held out for a long time against the Byzantine army which captured it from them in 552 A. D. In the ninth century it was completely burned down by the Saracens, and in the thirteenth, having become the rendezvous of a desperate gang of robbers, it was razed to the ground by the inhabitants of Naples. But few remains of Cumæ are now in existence.

Cumaná, koo-mää-naa': seaport-city; state of Bermudez, Venezuela; on the Manzanares river, a mile from the Gulf of Cariaco (see map of South America, ref. 1–D). The climate is hot and unhealthful, and the place is visited by frequent earthquakes. The exports are coffee, cacao, sugar, hides, and tobacco. Ships anchor in the roadstead, as there are no wharves. Cumaná was settled by missionaries in 1512, but soon abandoned; it was refounded by Gonzalez Ocampo in 1520, and is thus the oldest city of European origin on the continent of America. It gave its name to one of the old Spanish provinces. Pop. (1891) 12,057. HERBERT H. SMITH.

Cum'berland: the most northwestern county of England; bounded N. by Scotland and the Solway Firth, E. by Northumberland and Durham, S. by Westmoreland and Lancashire, and W. by the Irish Sea. Area, 1,515 sq. miles. The surface is mountainous and picturesque. The highest points are Sca Fell, 3,210 feet, and Skiddaw, 3,058 feet, above the sea. The chief rivers are the Esk, Eden, and Derwent. The scenery is adorned by numerous beautiful lakes, including Derwentwater and Ulleswater, the latter of which is 9 miles long. The land is divided into small freeholds. The main crops are wheat, oats, and turnips. Nearly three-fourths of the corn crops consist of oats. That variety of oats which is known by the name of the potato oat, and which now is cultivated in every part of the United Kingdom, was first discovered in Cumberland in 1788. Sheep and cattle are reared to some extent. Coal, copper, silver, iron, lead, plumbago, limestone, marble, and Silurian slate are found here. There are manufactures of woolens, cottons, linens, earthenware, and glass. The chief town is Carlisle. This county formed part of the ancient CUMBRIA (*q. v.*). Pop. (1891) 266,549; (1901) 266,504.

Cumberland: city and railway center; capital of Allegany co., Md. (for location of county, see map of Maryland, ref. 1–B); romantically situated on the Potomac. In population and commerce it is the second city in the State. It is the head of navigation of the Chesapeake and Ohio Canal (leading to Georgetown, D. C.) and the shipping-point for the semi-bituminous coal produced in the vicinity which constitutes the principal traffic of that canal. It is 178 miles W. by N. from Baltimore, and 153 miles S. by W. from Pittsburg, Pa. Its manufacturing industries comprise extensive rolling-mills for rails and bars and factories for other railroad iron, a factory for the manufacture of steel, foundries, machine-shops, glass-manufactures, flour and cement mills, railway-car and repair shops, and numerous minor enterprises. Its mercantile interests employ a large capital. An admirable system of water-works (on the Holly plan) furnishes an abundance of water. The steadily developing coal-trade of Cumberland, in connection with its growing iron industries, forms the chief source of its prosperity. Pop. (1880) 10,693; (1890) 12,729; (1900) 17,128. EDITOR OF "TIMES."

Cumberland: city; Barron co., Wis. (for location of county, see map of Wisconsin, ref. 3–B); on railway; 87 miles from Minneapolis, Minn. Its principal industry is lumbering. Pop. (1880) 246; (1890) 1,219; (1900) 1,328.

Cumberland, RICHARD: English dramatist and essayist; a grandson of Richard Bentley; b. at Trinity College, Cambridge, Feb. 19, 1732. As secretary to Lord Halifax, he entered diplomatic life, but was unfortunate in this and retired to the pursuits of literature. Of his many successful comedies, the best known is *The West Indian*. Among his miscellaneous writings, the most important are his *Memoirs* (1806). D. at Tunbridge Wells, May 7, 1811.

Cumberland, WILLIAM AUGUSTUS, Duke of: the third son of George II., King of England; b. Apr. 26, 1721. He commanded the allied army which was defeated by the French at Fontenoy in 1745. He defeated the army of the Pretender at Culloden in Apr., 1746, and was censured for his cruelty in that battle. During the Seven Years' war he commanded an English army, which was defeated at Hastembeck in 1757. D. Oct. 31, 1765.

Cumberland and Teviotdale, DUKE OF (Great Britain, 1799), and Earl of Armagh (Ireland, 1799): titles borne by the ex-King of Hanover, who was a prince of the blood in Great Britain, being first cousin to Queen Victoria. His full name was GEORGE FREDERICK ALEXANDER CHARLES ERNEST AUGUSTUS. He was born at Berlin, May 27, 1819, and was married Feb. 18, 1843, to the Princess Alexandrina Marie of Saxe-Altenburg. He succeeded to the throne of Hanover Nov. 18, 1851, as George V., on the death of his father, Ernest Augustus. He took sides with Austria against Prussia in 1866, and was deprived of his kingdom, which was annexed to Prussia, Sept. 20, 1866. D. June 12, 1878.—His eldest son, the present duke, is PRINCE ERNEST AUGUSTUS; b. Sept. 21, 1845. See HANOVER.

Cumberland Gap: a narrow pass through the Cumberland Mountains, on the line between Kentucky and Tennessee and at the western extremity of Virginia. It was an important strategic point in the civil war (1861–65), and was strongly fortified by the Confederates. It was abandoned by them June 18, 1862, and on the same day was occupied by the national troops under Gen. G. W. Morgan. In Aug., 1862, Gen. E. Kirby Smith outflanked this position by a march through Big Creek Gap, and Gen. G. W. Morgan, in consequence of lack of forage and supplies, was compelled to destroy and evacuate the works, which was successfully done on Sept. 11. He was hotly pursued northward by a force of Confederates under John H. Morgan. On Sept. 9, 1863, Gen. Frazer, who held the gap with a brigade of Buckner's troops, surrendered after a siege of only four days to Gen. Burnside's troops. The gap itself is a cleft 500 feet deep, and in some places is only wide enough for a road. If well provisioned, it might have been held by a small force against any opposing army. Revised by J. MERCUR.

Cumberland Island: peninsula of Baffin Land, North America; forms a portion of that coast of Davis's Strait which lies between Hudson's Strait and Lancaster Sound.

Cumberland Mountains: a range of the Appalachian system, forming part of the boundary between Virginia and Kentucky. The range extends in a generally S. W. direction across Tennessee, dividing East from Middle Tennes-

see. These mountains here form an elevated plateau, seldom over 2,000 feet high, but at some points nearly 50 miles across. The range in Tennessee has been described as capable of furnishing "a highway from Kentucky to the Alabama line along its flat top, along which a traveler may pass without once descending, or even without discovering at any time his elevation." On both sides the plateau breaks off in steep sandstone cliffs, the western side much notched, the eastern quite regular. Its immediate sides are from 800 to 1,000 feet high on either side. Both above and below the sandstone are valuable deposits of coal, and near the foot of the slope on each side outcrops a deposit of iron ore known as the "Clinton" ore-bed.

Cumberland Presbyterian Church: a church originating in the nineteenth century. In 1797 a very remarkable revival of religion began to develop in Southwestern Kentucky. The principal minister connected with its early history was Rev. James McGready. Mr. McGready was a Presbyterian, and was educated in Western Pennsylvania, at what became afterward Jefferson College, but he began his ministry in North Carolina. He was a man of unusual earnestness and power in the pulpit. His earnestness and zeal brought him into collision with the community in which he was laboring. The result was a removal from North Carolina to Kentucky in 1796. He was settled in charge of three congregations—two in Logan co., Ky., Gaspar River and Little Muddy River, and one in Tennessee, Red River, near the dividing line between the two States.

Mr. McGready's great zeal soon began to show itself in his new field of labor, and in order to bring his people into sympathy and co-operation with him, he proposed to them a written covenant, which they were to subscribe as a pledge of their earnest intention to fulfill its conditions. The measure was an incipient effort toward what was felt to be so necessary—a great revival of religion. A copy of this covenant is embodied here, as an illustration of the views and feelings, at the time, of a country pastor and a Christian people, surrounded as they were by a literal and a spiritual wilderness. "When we consider," say the covenanters, "the work and promises of a compassionate God to the poor lost family of Adam, we find the strongest encouragement for Christians to pray in faith—to ask in the name of Jesus for the conversion of their fellow-men. None ever went to Christ, when on earth, with the case of their friends that were denied, and although the days of his humiliation are ended, yet for the encouragement of his people he has left it on record 'that where two or three agree upon earth to ask anything in prayer, believing, it shall be done.' Again, 'Whatsoever ye shall ask the Father in my name, that will I do, that the Father may be glorified in the Son.' With these promises before us we feel encouraged to unite our supplications to a prayer-hearing God for the outpouring of his Spirit, that his people may be quickened and comforted, and that our children, and sinners generally, may be converted. Therefore, we bind ourselves to observe the third Saturday in each month for one year as a day of fasting and prayer for the conversion of sinners in Logan County and throughout the world. We also engage to spend one half hour every Saturday evening, beginning at the setting of the sun, and one half hour every Sabbath morning, beginning at the rising of the sun, in pleading with God to revive his work."

This covenant was evidently not a mere formality. The hearts of the preacher and people were in it. In May of 1797 occurred the first developments of the desired work. In July of 1800 occurred the first camp-meeting that ever was held in Christendom. The plan of the meeting was suggested by the circumstances of the country, and the fact that vast crowds were in the habit of assembling at the sacramental meetings from distances varying from 10 to 100 miles. Great numbers professed religion at the camp-meetings and upon other occasions, and the work spread with wonderful rapidity and power over Southwestern Kentucky and what was called the Cumberland Country—now Middle Tennessee—lying adjacent.

The ministers who co-operated with Mr. McGready were Messrs. William McGee, Samuel McAdoo, William Hodge, John Rankin, Presbyterians, and Mr. John McGee, Methodist. These men were all of Scotch-Irish origin, and had emigrated from North Carolina. It may be mentioned here that when the Cumberland Presbyterian Church came to be fully organized nine-tenths of its ministry, and at least four-fifths of its membership, were of Scotch-Irish descent.

The rapid progress and widespread influence of the revival produced the necessity of organizing a great many new congregations; and this, of course, created a necessity for more ministerial laborers. The Presbyterian Church could not supply them in the ordinary way. There were no schools, and if schools had been abundant the congregations could not wait until young men would be able to go through such a course of literary and theological training as is customarily required in the Presbyterian Church preparatory to licensure and ordination. The patriarch* of Presbyterianism in Kentucky visited the region of the revival, and, seeing the necessities of the congregations, advised the ministers and leading laymen of the Church to select such young men as they thought promised usefulness, and direct their attention to the work of the ministry, although they might not be able to obtain what was considered a full ministerial education. The counsel seemed practical, and three young men at first were encouraged to prepare themselves for the work as well as they could. These young men presented themselves to the Transylvania Presbytery in Oct., 1801. The presbytery hesitated, but at length, in Oct., 1802, they were all licensed as probationers for the holy ministry. At the same presbytery two others were received as candidates for the ministry. Opposition, however, at once developed itself. In Oct., 1802, the Transylvania Presbytery was divided, and the Cumberland Presbytery was formed, embracing the more immediate region of the revival. The Cumberland Presbytery from time to time licensed a few others and ordained two or three. These were all what were called uneducated men; they were all, however, men of promise, and some of them became distinguished in subsequent years. The opposition was continued in the new presbytery.

There was difficulty from another source. The revival ministers were warm-hearted, and controlled less by theological and technical than by practical, and what they regarded as spiritual, considerations. The young men, too, had not learned to split all the metaphysical hairs of theology, and there were some expressions in the Confession of Faith which seemed to them to teach the doctrine of fatality. This they could not receive, and were allowed to except to it in their licensure and ordination.

There were thus two subjects of dissension between the parties; one was educational, the other theological. The revival ministers did not object to education for the ministry, but to the rigid application of the rule in the circumstances surrounding them. The young men did not object to the Confession of Faith, but to those expressions in it which seemed to them to imply the doctrine of fatality. Their warm-hearted and liberal fathers thought proper to indulge them in their skepticism on this subject. They adopted the Confession of Faith with the single exception. The difficulties became serious, and were finally brought before the synod of Kentucky. The synod of 1804 appointed a committee to attend a meeting of the Cumberland Presbytery and inquire into the condition of things. None of the committee fulfilled the appointment except one, and he was notoriously a persecutor of the presbytery, and was regarded as a spy. Nothing good, of course, resulted. The synod at its next meeting, in 1805, appointed a commission consisting of fifteen members to visit the region in which the difficulties existed, to confer with the Cumberland Presbytery, and to endeavor to restore quiet and harmony. The commission met on Dec. 3, 1805, at Gaspar River meeting-house, in Logan co., Ky. The first measure of the commission was to require of the presbytery a surrender of all the young men who had been licensed and ordained in what they regarded a questionable manner, for a re-examination by the commission, with a view to a confirmation or an annulling of the proceedings of the presbytery in each particular case. It is to be borne in mind that several of the men thus required to be surrendered to the commission were themselves members of the presbytery. The presbytery declined compliance, upon the ground that the constitution of the Presbyterian Church gives to the presbytery alone the power "to examine and license candidates for the holy ministry; to ordain, install, remove, and judge ministers"; that it gives no such power to a synod, much less to a commission of synod, nor to any other judicature of the Church. The commission then called upon the young men to submit themselves for re-examination; they also declined, whereupon the commission passed the following resolution: "*Resolved*,

* Rev. David Rice.

That as the above-named persons never had regular authority from the presbytery of Cumberland to preach the gospel, etc., the commission of synod prohibit, and they do solemnly prohibit, the said persons from exhorting, preaching, and administering the ordinances, in consequence of any authority which they have received from the Cumberland Presbytery, until they submit to our jurisdiction and undergo the requisite examination."

The names of the persons thus proscribed are omitted as a convenience. Four of them were ordained ministers and members of the presbytery; the others, eight in number, were either licentiates, candidates for the ministry, or exhorters. The presbytery took the ground in the controversy that the proceedings of the commission were unconstitutional, and, of course, that the proscribing act was unconstitutional and void. Nevertheless, from a general respect to authority, and from an obvious desire to procure a reconciliation and enjoy peace and quietude as far as possible, both the proscribed members, and those who had promoted their induction into the ministry and sympathized with them, constituting a majority of the presbytery, organized themselves into what they called a *council*, determining in this manner to endeavor to carry forward the work of the revival, to keep the congregations together, but to abstain from all proper presbyterial proceedings, and await what they thought would be a redress of their grievances. The synod of Kentucky at its sessions in 1806 dissolved the Cumberland Presbytery, and annexed the members who had not been placed under the ban of the commission to the Transylvania Presbytery.

The council continued their organization from Dec., 1805, to Feb., 1810. By that time they became satisfied that they had nothing to hope either from the synod or the General Assembly. As a last resort, and in order to save what they represent to the General Assembly as "every respectable congregation in Cumberland and the Barrens of Kentucky," two of the proscribed ministers, Finis Ewing and Samuel King, assisted by Samuel McAdam, one of those who had been placed under an interdict by the commission for his participation in what they denominated the irregularities of the presbytery, reorganized the Cumberland Presbytery at the house of Mr. McAdam, in Dickson co., Tenn., on Feb. 4, 1810. It was organized as an independent presbytery. It will be observed that it was a reorganization of a presbytery which had been dissolved, and which had received its name from its locality. The Church which grew up from these beginnings naturally took the name of its first presbytery as a prefix. Hence this Church is called, from the circumstances of its origin, "The Cumberland Presbyterian Church." It extends now from Pennsylvania to the shore of the Pacific, but it originated in what was called, at the time, the "Cumberland Country." The name suggests nothing connected with the denomination except the locality of its origin.

The new presbytery held its first adjourned meeting in March, the month following its organization. There were present four ordained ministers, six licentiates, and seven candidates for the ministry. These men constituted really the fathers and founders of the Cumberland Presbyterian Church. Early in the year 1813 the presbytery had become so large that it divided itself into three presbyteries, and constituted the Cumberland Synod. This synod, at its sessions in 1816, adopted a Confession of Faith, catechism, and system of church order in conformity with the principles avowed upon the organization of the presbytery. The Confession of Faith is really a modification of the Confession of Faith of the Presbyterian Church. It was intended by the framers to exclude only the offensive doctrine which had been a principal cause of all the difficulties. The government is Presbyterian.

In 1826 its first college was organized under the supervision of the Church. It was located at Princeton, Ky. It was a manual-labor school. In 1830 its first paper was published under the patronage of the Church. It was a weekly religious and literary journal, also published at Princeton. In 1828 the Cumberland Synod was divided into three synods, and a General Assembly succeeded. The first meeting of the Assembly was held in May, 1829.

The Church has under its patronage three weekly newspapers, one quarterly, and two monthlies—one devoted to the interest of women. It has also under its patronage three chartered universities and several colleges, both for young men and women. One of the universities has regular collegiate, theological, law, and medical departments.

In 1883 the Cumberland Presbyterian Church adopted a revised Confession of Faith, the changes made being in the line of those made in the revisions in progress in the other Presbyterian Churches. This Church is a recognized member of the Alliance of Presbyterian Churches. It 1891 it numbered 121 presbyteries, 1,875 ministers and licentiates, 2,844 congregations, and 165,472 communicants. Later and fuller statistics will be found in the article on the PRESBYTERIAN CHURCH (*q. v.*).

RICHARD BEARD.
Revised by WILLIS J. BEECHER.

Cumberland River: an affluent of the Ohio, rising among the Cumberland Mountains in Kentucky, near the southeastern boundary of that State. It flows nearly westward, crosses the southern boundary of Kentucky, describes an extensive circuit in Middle Tennessee, passes by Nashville, and returns into Kentucky. It afterward flows northwestward, and enters the Ohio at Smithland. The Cumberland and Tennessee rivers are only about 3 miles apart at a point nearly 20 miles from Smithland. Length, estimated at 650 miles. Steamboats can ascend it to Nashville, about 200 miles from its mouth, and it is navigable above Nashville, at certain seasons, 400 miles.

Cum'bria; an ancient principality of the Cymri in Great Britain; comprised Cumberland in England and part of Scotland, namely, the southwestern portion of the region lying between the Ribble and the Clyde. It was ruled by its own kings until about 950 A. D. Scottish Cumbria then became the kingdom of STRATHCLYDE (*q. v.*).

Cumbrian Mountains: a range or group of mountains in the north of England, occupying parts of Cumberland, Westmoreland, and Lancashire. This region, called the "English Lake District," is remarkable for its picturesque scenery, and is much frequented by tourists. Here are numerous lakes, the largest of which are Windermere and Ulleswater. These mountains are mostly formed of granite and Silurian rocks. The highest point, Sca Fell Pike, rises 3,216 feet above the sea.

Cum'min- (or **Cumin) seed**: the fruit of *Cuminum cyminum*, a plant belonging to the family *Umbelliferæ*. It is the only known species, and is found in Egypt and the adjacent countries. It is an annual with branched stem, thread-like leaves, with umbels of small white or pink flowers. It has been cultivated from remote times for the sake of its seeds, which have an aromatic taste somewhat resembling caraway. In Germany and Holland it is used in cookery. As a medicine it is mostly limited to veterinary practice. It is cultivated in Northern Africa, India, and Southern Europe; but the seeds are mostly imported from Sicily and Malta. Oil of cummin is abundantly obtained from the seed. The oil of cummin consists of a mixture of two distinct oils, one called cymene ($C_{20}H_{14}$); the other regarded as a hydride of cumyl ($C_{20}H_{11}O_2.H$). This oil is of a strong bitter, disagreeable taste, with the general properties of the other essential oils.

Cummin is mentioned both in the Old and the New Testaments (Isa. xxviii. 25–27; Matt. xxiii. 23), and in the works of Hippocrates and Dioscorides. Among the Romans it was taken medicinally, the seeds being ground and mixed with water and wine. It was believed to produce pallor of the face (Horace, *Epist.* 1. 19; Persius, *Satyr.* 5. 55), and Pliny tells us that the followers of the famous rhetorician Porcius Latro commonly used it in order to produce a complexion bespeaking close application to study. In the Middle Ages cummin was one of the most common spices grown in Europe, and much appreciated. It was used as a stimulant also, and the seeds brought in the thirteenth and fourteenth centuries a price of about 1*s.* 4*d.* per pound.

Cumming, JOHN, D. D., F. R. S. E.: Scottish preacher; b. in the parish of Fintray, Aberdeenshire, Nov. 10, 1807; became in 1832 minister to the Scottish Church in Crown Court, Covent Garden, London, and so remained till his resignation in 1879. He published interpretations of the apocalyptic prophecies, *The Great Tribulation*, *The Destiny of Nations*, etc. He was a zealous opponent of the Roman Catholic Church and a defender of the National Church of Scotland. D. in Chiswick, London, July 5, 1881.

Cumming, ROUALEYN GORDON: known as the "lion-hunter"; b. at Altyre, Scotland, Mar. 15, 1820. He was the son of a baronet, was educated at Addiscombe, and entered a cavalry regiment in the East India service, and afterward took a commission in the Cape Mounted Rifles in South Africa. While there he distinguished himself by his exploits in killing lions, elephants, and other wild beasts. Of his surprising adventures he wrote an account in book form, which was highly popular, but after a time fell into

a discredit which it hardly deserved. He afterward lectured in Great Britain upon sporting subjects. D. Mar. 24, 1866.

Cummings, Amos J.: journalist; b. at Conkling, Broome co., N. Y., May 15, 1841; received a common-school education; entered a printing-office at twelve, and has set type in nearly every State in the Union; as a boy served with Walker in the last invasion of Nicaragua; served in the Union army in the civil war; has filled editorial positions on the New York *Tribune* under Horace Greeley, New York *Sun*, and New York *Express*; elected as a Democrat to Fiftieth Congress; elected to Fifty-first Congress to fill the vacancy caused by the death of S. S. Cox; re-elected to the Fifty-second Congress; defeated for Congress 1894, but in Nov., 1895, was elected to Fifty-fourth Congress to fill a vacancy caused by the death of A. J. Campbell; author of *Horace Greeley Campaign Songster* (1872); *Sayings of Uncle Rufus* (1880); and *Ziska Letters*.

Cummings, Joseph, D. D., LL. D.: Methodist Episcopal theologian; b. at Falmouth, Me., Mar. 3, 1817; graduated at Wesleyan University in 1840; entered the ministry in 1841; became Professor of Theology in the biblical institute at Concord, N. H., 1853; president of Genesee College 1854; president of Wesleyan University, Middletown, Conn., 1857; resigned and became professor there 1875; preached 1877–81; became president of Northwestern University, Evanston, Ill., 1881. D. in Evanston, Ill., May 7, 1890.

Cummings, Thomas Seir: See the Appendix.

Cum'mins, Francis, D. D.: preacher; b. near Shippensburg, Pa., in 1752; one of the framers of the Mecklenburg Declaration of Independence (May, 1775); in 1780 licensed to preach by the presbytery of Orange, N. C.; pastor of Presbyterian churches in the Carolinas and Georgia. D. in Greensborough, Ga., Feb. 22, 1832.

Cummins, George David, D. D.: clergyman; b. near Smyrna, Del., Dec. 11, 1822. He was graduated from Dickinson College in 1841, and was a licentiate in the Methodist Episcopal Church for two years. In 1845 he studied for orders in the Protestant Episcopal Church; in October of the same year was ordained a deacon, and in 1847 priest. For six years he was rector of Christ church at Norfolk, Va., and then successively rector of St. James's church, Richmond, Trinity church, Washington, St. Peter's church, Baltimore, and Trinity church, Chicago. In 1866 he was elected assistant Bishop of Kentucky. In Nov., 1873, he resigned his position, withdrew from the Protestant Episcopal Church, and founded the Reformed Episcopal Church, of which he was made presiding bishop Dec. 2, 1873. D. at Lutherville, Md., June 26, 1876. See his *Life* by his wife (New York, 1878). Revised by W. S. Perry.

Cummins, Maria Susanna: novelist; b. at Salem, Mass., Apr. 10, 1827. Her most successful novels were *The Lamplighter* (1853), translated into French and German; *Mabel Vaughan* (1857); *El Fureidis* (1860); and *Haunted Hearts* (1863). She contributed to the *Atlantic Monthly* and other magazines. D. in Dorchester, Mass., Oct. 1, 1866.

Cumulative Voting: See Representation.

Cumulus: See Clouds.

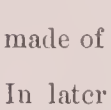
Cunard', Sir Samuel: ship-owner; b. in Halifax, Nova Scotia, Nov. 21, 1787; became the head of the extensive firm of steamship owners, Cunard & Co.; and in 1859 was made a baronet. D. Apr. 28, 1865.

Cunax'a: ancient town of Babylonia; on the east bank of the Euphrates; about 60 miles N. of Babylon. In 401 B. C. a battle occurred here between Artaxerxes Mnemon, King of Persia, and his brother Cyrus (the Younger), in which the latter was defeated and killed.

Cundinamar'ca: a department of Colombia; between the Orinoco and its branches, the Meta and Guaviare; bounded N. by Boyacá and Venezuela, E. by Venezuela, S. by Cauca, and W. by Tolima. Area variously estimated from 79,600 to 92,000 sq. miles. The western part is traversed by the central and eastern Cordilleras of the Andes. The intervening valley has a delightful climate, and most of the towns are situated there. The eastern part belongs to the warm Orinoco plains, mainly grass-lands adapted for grazing but as yet very thinly settled. The most important exports are tobacco and hides. Pop. (1884) 537,658. Capital and chief city, Bogotá. Herbert H. Smith.

Cu'neiform [from Lat. *cu'neus*, wedge + *forma*, shape]: having the form of a wedge; applied to one of the bones of the wrist and to three of the tarsus; also to certain wedge-shaped characters found on ancient monuments, especially in Asia.

Cuneiform Inscriptions: ancient writings in wedge-shaped or arrow-headed characters peculiar to Western Asia. The writings of the Babylonians and Assyrians are usually understood by the term, because these peoples made such large use of the script. But it was by no means confined to these. It was likewise used in Armenia, Elam, Asia Minor, Palestine, Persia, and on the Euphrates in the Hittite country. The use in Palestine and the Hittite land was as early as the fifteenth century B. C., though the fact of such use was unknown in modern times until the great discovery made at El-Amarna in Egypt in 1887. The language in this case is mainly Assyrian, though there are a few specimens in another tongue not yet known. The use of the cuneiform script in Persia does not seem to have antedated Cyrus the Great, sixth century B. C.; at least no specimen of older date has yet been found.

The origin of this method of writing belongs to a prehistoric time. Like all early systems, it developed from picture-writing, in which each character was a representation of an entire object or idea. A few of the cuneiform signs have retained a likeness to the original object, but most of them have changed so greatly as no longer to suggest a picture. Thus the sign for a hand was originally made of five straight lines representing the fingers (). In later times one of the lines was rejected, and the four horizontal wedges may be thought of as representing the fingers, while the perpendicular wedge represents the thumb (). The oldest forms of the writing, like the seal of Sargon of Akkad and the inscriptions found by De Sarrec at Tello, are read from above downward, the columns, however, advancing from right to left. By changing the columns or lines to horizontal, the writing in later times came to read from left to right, as in English. Thus the Assyrian language, like the Ethiopic, came to differ from the other Semitic tongues, which read from right to left. The oldest specimens of Egyptian writing likewise read from above downward, as the Chinese still does, even though it may not be possible to prove a direct connection between the three systems.

Who the inventors of the cuneiform script were will perhaps always remain unknown. Most students of Assyriology give the credit to the non-Semitic people, commonly known as Akkadians, who preceded the Semites in the occupancy of the Babylonian territory. Not only the writing but a large part of the culture of the Babylonian Semites is likewise attributed to these Akkadians, or more strictly to them and to the closely related Sumerians. There are, however, several eminent scholars who call in question this thesis. Chief among them are Josef Halévy, of Paris, and Professor Friedrich Delitzsch, of Leipzig. Both deny that there ever was such a people as the Sumero-Akkadians, Halévy maintaining that the supposed specimens of their writings are but a cryptographic manner of writing Assyrian, while Delitzsch holds them to be only an archaic form of Assyrian. While the question as to the existence of a Sumero-Akkadian people and civilization must thus be called an open one, the great body of specialists affirms such existence. Whatever may be the truth in the case, there are various phenomena in the Babylonian-Assyrian civilization which seem to point to a non-Semitic origin. Such origin for the script in particular seems best to account for the ill success in adapting a considerable number of the signs to the Semitic consonants. Furthermore, many of the syllabic values of the signs are based on words which have no natural Semitic etymology.

In the development of the script from picture-writing many of the signs have gone through numerous changes, depending on the era and the locality. Thus a student might be perfectly familiar with the late Assyrian type and still be unable to read the late Babylonian, or he might know both well and still be powerless in the presence of an archaic text. The differences are greater than between the alphabets of the Greeks, Romans, and Germans. In the later Assyrian and Babylonian times, when men affected the antique, there was a tendency to revert to the older types of the cuneiform writing.

The passage from the pictorial stage of the script, in which both curves and straight lines were used, to the stage

in which only wedges were employed was gradual. The rejection of curves and the development of wedges seem both to have resulted from the use of soft clay as writing material and from the form of the stylus, which was made by three plane surfaces meeting at a point like the angle of a cube. The stylus was pressed into the soft clay, tracing on this material being difficult. There are as many impressions of the stylus as there are wedges in any given character. In the case of building-bricks stamps were at times employed, so that an entire inscription containing name and titles of the royal architect was stamped by a single impression on the clay. This may be compared to printing from plates. The stone seals which were rolled over commercial documents imparted their carvings and inscriptions likewise to the soft clay. The stamps and seals thus described excepted, the writing on clay was a slow and painstaking process, the point of the stylus making the head and the line uniting two planes of the cube making the body or tail of the wedge. When the writing is on stone it is chiseled into likeness with that on clay. The number of wedges in a single character varies from one to fifteen or even more, there being, however, no relation between the number of wedges and the complexity of the idea represented.

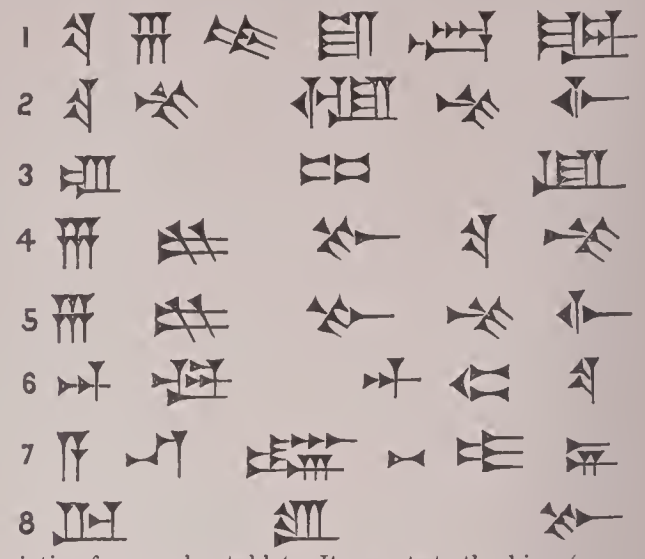
Out of the pictorial use of the script the ancient scribes derived a series of syllables. Their method was to employ a sign not only to represent an object, but also to represent the first syllable of the word expressing that object, and then they could use this syllabic sign in spelling any other word in which such syllable occurs. Thus the Akkadian word for heaven is *ana*, and the sign  representing this word came to be used in spelling any word containing the syllable *an*, like the Semitic word *annu*, this. With the rise of writing by syllables the pictorial, or, as it is called, ideographic, way of writing was not discontinued. Nearly or quite all extant inscriptions contain a mixture of ideograms and of syllabic signs, and the ease of reading depends on the relative proportion of the two systems. As time went on the tendency became more pronounced to use syllabic signs exclusively, save in the case of certain words of very frequent occurrence, for which ideograms were retained. The Japanese writing is likewise syllabic, while the use of many Chinese characters representing objects makes the Japanese writing precisely parallel to the Babylonian-Assyrian method.

The next step, that of deriving an alphabet from the syllabic script, the Babylonians persistently refused to take. They were too conservative and their script too sacred. The step in advance was reserved for the Persians, doubtless under the influence of other nations using a regular alphabetic system. We can see no indication of a tendency on the part of the Babylonians to adopt the improved method of the Persians, nor does the Old Persian cuneiform alphabet of some forty-five or fifty characters seem to have had any successors. Compared with other alphabetic systems, it was indeed too cumbrous. Even the Persians did not use it exclusively. The royal records are also written in the mixed syllabic-ideographic system of the Babylonians. This mixed system maintained itself at Babylon in spite of political changes and the encroachments of alphabets till the first century before our era. It was employed by the scribes even of the Greek kings of Babylon.

The separate signs of the cuneiform script are several hundred in number. Some of these are used only as ideograms, others very largely as syllables, some both as ideograms and as syllables. The context usually shows how a sign is to be understood. Some signs have a variety of values both as ideograms and as syllables, while certain ideas and syllables are represented by a variety of signs. This diversity is often perplexing to the modern student, but becomes less so at every advance in the study.

The wedges of the cuneiform script are arranged horizontally, perpendicularly, or obliquely downward or upward at an angle of about 45°. Complex signs may be composed of wedges arranged in all of these directions. The point of the wedge is toward the bottom or toward the right. There are separate signs for expressing the vowels, but none for the consonants (except in the Persian). Each syllabic sign is composed of one vowel and one or two consonants, never more than two. Thus we have such syllables as *ab*, *ib*, *ub*, *ba*, *bi*, *bu*, or *bab*, *bag*, *bar*, etc. Besides the separate signs for such syllables as *bab*, *bag*, *bar*, it was also possible to write the same sounds *ba-ab*, *ba-ag*, *ba-ar*, pronounced *bab*, *bag*, *bar*.

The decipherment of the cuneiform inscriptions began with the alphabetic variety of the Old Persians. Two men



Inscription from a clay tablet. It reports to the king (presumably Asshurbanipal) the arrival of the vernal equinox. It reads:
1. (On the) day 6th of (the) month Nisan
2. (the) day and (the) night
3. were equal.
4. 6 *kas-bu* (the) day
5. 6 *kas-bu* (the) night.
6. (The) god Nabu (and the) god Marduk
7. unto (the) king my lord
8. may they be gracious.

acting independently of each other were here the pioneers—Georg Friedrich Grotefend in 1802 and Henry Rawlinson about 1835. Though Grotefend has the distinction of being first in point of time, his work was not very fruitful until Christian Lassen, of Bonn, took it up in 1836. At the same time Rawlinson was in Persia copying the inscriptions and deciphering them by the same method which Grotefend had pursued. The success of both Grotefend and Rawlinson was an eminent stroke of genius. Grotefend relates how he began by applying to certain short inscriptions from Persepolis a formula which was contained in some other alphabetic writings from the same region. In this formula the word king frequently occurs. Grotefend noted at once that a particular group of signs always occurred in his inscriptions at intervals corresponding to the word king in the formula. The formula marked out certain other groups as proper names, and Grotefend believed from historical considerations that these must be the kings of ancient Persia. He thus determined the groups for the names of Hystaspes, Darius, Xerxes, and by this means made out several of the Old Persian letters. After the Old Persian was made out by Grotefend, Lassen, Rawlinson, Hincks, and others, it became possible to pass to the decipherment of the Babylonian-Assyrian, because these Old Persian inscriptions from Persepolis, Behistun, and Elwend were accompanied by translations into the Babylonian-Assyrian script and language. The greater complexity of this script, as already described, made the progress of decipherment slow and painful; but, on the other hand, the discoveries at Khorsabad, Nimrud, and Kouyunjik gave a great mass of new material and a new impetus to students. By 1850 the work of deciphering the form of the script as used by the Babylonians and Assyrians may be said to have been practically accomplished.

See Friedrich Delitzsch's *Assyrian Grammar*; Lyon's *Assyrian Manual*; Grotefend's account of decipherment in A. H. L. Heeren's *Ideen über die Politik*, etc. (Göttingen, 1815, vol. i.); Rawlinson's account in *Journal of the Royal Asiatic Society* (1847, vol. x.). D. G. Lyon.

Cuneo, koo-nā'ō: a province of Piedmont, Northern Italy; area, 2,882 miles. One-half of the province is level, the other half hilly. The chief river is the Tanaro. It produces wheat, maize, hemp, rice, and silk. Pop. (1894) 659,101. Capital, Cuneo, or Coni.

Cunha Barboza, koon'yaă-baăr-baw'zaă, Januario, da; Brazilian ecclesiastic and author; b. in Rio de Janeiro, July 10, 1780. He took orders in 1803, was named preacher for the royal chapel in 1808, and gained wide fame as a pulpit orator; was one of the most influential advocates of Brazilian independence; became an object of suspicion to the Government, and was banished in 1823, but exonerated and allowed to return the same year; was several times deputy; editor of the Government journal and of various other

periodicals; director of the national library, and one of the founders of the *Instituto Historico e Geographico Brazileiro*. He published many poems, mainly satirical; of these the best known are *Garimpeiros* and *Victheroy*. D. at Rio de Janeiro, Feb. 22, 1846. HERBERT H. SMITH.

Cunha Mattos, koon'-yăă-măăt'tōs, RAYMUNDO JOSÉ, da: Portuguese-Brazilian soldier and author; b. at Faro, Algarve, Portugal, Nov. 2, 1776. When fourteen years old he entered an artillery regiment, took part in the campaigns under Gen. Forbes 1793–96; from 1798 to 1817 was stationed on the island of São Thomé on the coast of Africa, and in the latter year was called to Brazil, where he was employed in many important positions, principally in organizing the army and the military school, and in preparing fortifications. He was military commandant of Goyaz in 1820, and returned to Rio as deputy from that province. In 1834 he attained the rank of *marechal do campo*. In 1831 and 1832 he traveled in Portugal on leave, and was a witness of the revolutionary struggles there. A man of high scientific attainments and an excellent observer, Gen. Cunha Mattos embodied his varied experiences in a series of valuable historical and geographical works. Among these are *Corographia historica das ilhas de S. Thomé, Principe, Anno Bom e Fernando Pó*; *Itinerario do Rio de Janeiro a Matto Grosso*; *Itinerario do Rio de Janeiro a Pará e Maranhão petas provincias de Minas Geraes e Goiaz*; *Corographia historica da provincia de Minas Geraes*; *Corographia historica de Goyaz*; *Diario dos trabalhos de ataque e defensa da cidade do Porto*; and *Repertorio da legistação militar*. He was one of the founders of the Instituto Historico. D. at Rio de Janeiro, Mar. 2, 1839.
HERBERT H. SMITH.

Cunliffe-Owen, Sir PHILIP: director of the South Kensington Museum; b. June 8, 1828; served for a time in the navy; became, 1857, deputy-general superintendent of the South Kensington Museum; held important positions in the London Exhibition in 1862; in the Paris Exhibition of 1867 (and 1878); in the Vienna Exhibition of 1873; and in the Centennial Exhibition of 1876, in the latter of which he was executive commissioner and organized the British section, and was presented with one of the four silver medals awarded by the Centennial Commission. D. in Lowestoft, England, Mar. 23, 1894.

Cunningham, ALLAN: Scottish author; b. at Blackwood, Dumfriesshire, Dec. 7, 1784; worked as a stone-mason in his youth. He removed to London in 1810, and began to write for the newspapers. He was employed as foreman in Chantrey's studio from 1814 to 1841. His *Traditional Tales of the English and Scottish Peasantry*, *Songs of Scotland*, *Life of Witkie*, and *Lives of British Sculptors, Painters, and Architects* are his best-known productions, besides some favorite songs. D. in London, Oct. 30, 1842.

Cunningham, JOHN, D. D., LL. D.: b. at Paisley, 1819; educated at the Universities of Glasgow and Edinburgh; licensed as preacher 1845, and ordained in the same year in the parish of Crieff, where he remained. His principal work is *The Church History of Scotland*, the standard on this subject. D. Sept. 1, 1892.

Cunningham, WILLIAM, D. D.: theologian; b. at Hamilton, Scotland, Oct. 2, 1805; educated at the University of Edinburgh; appointed pastor of Trinity College church in Edinburgh in 1834, and Professor of Theology in the New College in 1843. Author of *Historical Theology* (1862, 2 vols.); *The Reformers and the Theology of the Reformation* (Edinburgh, 1862); *Discussions on Church Principles* (1863); *Lectures on Evidences*; etc. D. in Edinburgh, Dec. 14, 1861. See his *Life* by R. Rainy (Edinburgh, 1871).

Cupar, or **Cupar-Fife**, koo'per-fīf: capital of Fifeshire, on the Eden; 32 miles N. of Edinburgh (see map of Scotland, ref. 10–I). It has a public library, the Duncan Institute, several newspaper-offices, and manufactures of coarse linens, earthenware, etc. A castle or fortress of the Macduffs, thanes of Fife, formerly stood here. Pop. (1891) 4,729.

Cupel [Fr. *coupelle*, a little cup]: a shallow and porous vessel, somewhat cup-shaped, generally made of bone-earth. It is used in the process of assaying gold and silver, which are fused with lead upon a cupel. The lead is oxidized in the process and sinks into the substance of the cupel, leaving the metal pure.

Cupid (in Lat. *Cupido*): the Roman name of the god of love, corresponding to the Eros (Ἔρως) of the Greek mythology. He was usually represented as the son of Venus, but ancient authorities differ respecting his paternity. He is represented as a beautiful winged boy, bearing a bow and arrows.

Cupids: post-village of Brigus district, on the north side of Conception Bay, Newfoundland, 2 miles from Brigus. Farming and cod and salmon fishing are carried on. Pop. 1,200.

Cupola: nearly synonymous with DOME (*q. v.*), used especially of small domes crowning towers or belfries. It is commonly but erroneously applied to any lantern, observatory, or similar structure rising above the roof of a building. Cupola is also the name of one form of blast furnace for reducing metallic ores. A. D. F. HAMLIN.

Cupping: in surgery, the application to the skin of small cups from which the air is partly expelled. If it be designed to withdraw blood from the patient, the skin is first scarified, a partial vacuum is produced in the cup by direct suction or by the flame of alcohol or of burning paper, and the mouth of the cup is applied to the scarified surface. "Dry cupping" is the same process without scarification. In this case no blood is drawn, the object being to stimulate a diseased surface or to produce derivative action.

Cúra: a town of the state of Guzman Blanco, Venezuela; 60 miles S. W. of Caracas (see map of South America, ref. 1–D); between the valley of Aragua and the plains of Guarico; elevation, 1,703 feet; founded in the seventeenth century. It has broad streets, several small parks, and an excellent library. Pop. 12,198.

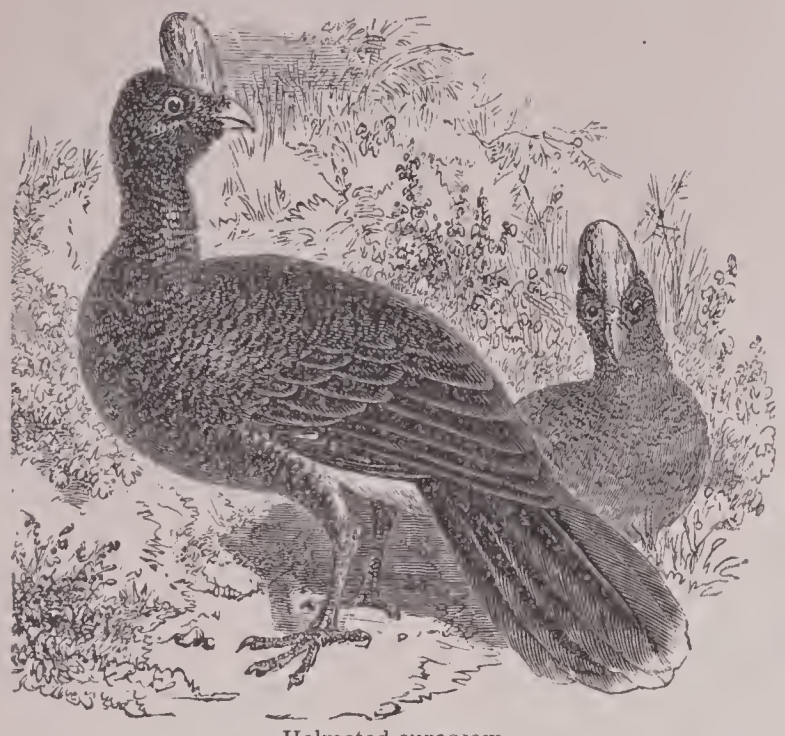
Curaçao, **Curazao**, or **Curaçoa**: one of the Dutch West Indian islands, of the Leeward group; about 50 miles off the coast of Venezuela, in lon. 69° W.; area, 210 sq. miles (see map of West Indies, ref. 9–I). It is long and narrow, partly hilly (the highest point 1,200 feet above the sea), and partly a low coral formation. The island is poorly watered, and most of it is arid; but sugar-cane, tobacco, maize, vegetables, and fruits are raised in the valleys. The climate is hot and often unhealthful. The principal importance of Curaçao is derived from its excellent harbor on the southern side, which is regularly visited by steamers, and has become a center of commerce. The capital and principal town, WILLEMSTAD (*q. v.*), lies at the entrance of this harbor. The Dutch colony of Curaçao embraces besides this island Buen Ayre or Bonaire, to the E. of it, with 95 sq. miles of area and 3,821 inhabitants; Aruba, to the W., 69 sq. miles and 7,743 inhabitants; and the islets of St. Martin, St. Eustache, and Saba in the Windward West Indies, which together have 29 sq. miles of area and 7,353 inhabitants. It is ruled by a governor and council appointed by the King of the Netherlands, and residing at Willemstad. Klein Curaçao, a rock off the east point of Curaçao, yields large quantities of phosphate of lime, and sea-salt is obtained in the archipelago by evaporation. Curaçao was discovered by Ojeda in 1499, and Spanish colonies were established there. It was seized by the Dutch in 1632, and held by them until the wars of the empire, when it was taken by the English. Restored to the Dutch by the peace of 1814, it has since remained under their rule. Pop. (1895) 28,187. HERBERT H. SMITH.

Curaçoa: a liqueur which is made by digesting Curaçao orange peel in diluted spirits along with a little cinnamon, and often a little mace or cloves. The mixture is distilled and then sweetened with sugar.

Cura'ri, sometimes spelled **Cura're**, **Woora'ri**, and **Ura'ri**: a poison probably composed of several poisons derived from various sources, but all of them vegetable in origin; sometimes called India arrow poison. It is obtained chiefly by scraping the young bark of several different trees, adding water to the scrapings, and boiling to a sirupy consistence. It possesses the peculiar properties of being able to paralyze the peripheral ends of the motor nerves, causing total muscular paralysis without materially influencing the circulation, the respiratory center, or the cerebral processes.

Curas'sow: any bird of several species belonging to the order *Gallinæ* and family *Cracidæ*. They have a strong bill, with a cere at the base; much rounded wings, and all four toes on the same level. They inhabit the forests of South America, N. of the Argentine Republic and E. of the Andes, one species only (*Crax globicera*) extending into Mexico. Curassows are mostly large birds, nearly equaling a turkey in size. They assemble in flocks, nest in trees, are readily domesticated, and are very good eating. The crested curassow (*Crax alector*) is the most common species, the helmeted curassow (*Pauxis galeata*) one of the most striking. The bird derives its name from a bony excrescence on top

of the head, nearly as large as a hen's egg, and of a blue color. It is hollow, very light bluish, larger in the male



Helmeted curassow.

than in the female, and is not developed until after the first moult. The plumage of this species is glossy black, white on the belly and tip of tail.

The smaller species of the family *Cracidæ* form another division, and are termed Guans (*q. v.*). F. A. Lucas.

Curate [Mid. Eng. *curat*, from Late Lat. *cura'tus*, p. partic. of *cura're*, care for, heal > Ital. *curato*: Fr. *curé*]: one who has the cure of souls. The term has been variously appropriated to different officers of the Church, but since the close of the sixteenth century in England has been restricted to assistant clergy, deputies, or substitutes. The bishop, or some officer having episcopal authority, appoints the curate's salary and grants his license. There are "temporary" and "perpetual" curates. The temporary or *stipendiary* can be removed at the will of the bishop or vicar. Perpetual curates can not be thus removed. Their salary is paid from tithes established at the foundation of the chapel, and it becomes the duty of the impropriators to support them. The salaries of curates are too often disproportionate to their services, and they are almost destitute of legal rights, being entirely subject to episcopal authority. The word is retained in the Ordinal of the American Episcopal Church, but it is usually supplanted in ordinary speech by the term "assistant minister."

Curcu'lio [Lat., weevil]: a name given to many weevils or coleopterous insects of the family *Curculionidæ*, but perhaps most frequently applied to the *Conotrachelus nenuphar*, a small dark-brown insect, speckled with yellowish white and black. In spring and early summer it attacks the young fruit, such as apples, pears, apricots, etc., but its object of special attack is the plum. The female makes a crescent-shaped puncture in which she deposits her egg. The egg soon hatches, and the maggot feeds upon the young plum, which generally falls to the ground in a short time, and the larva burrows in the earth, becoming a perfect insect in about three weeks. Several generations are said to appear in one season. The destruction caused by this insect upon all kinds of smooth-skinned fruits is a very serious loss. Another destructive curculio is the plum-gouger (*Anthonomus prunicida*), which occurs very abundantly in the Western U. S. It makes a round puncture. It undergoes tranformation inside the kernel of the plum. Another insect of this genus makes numerous holes in the apple; still another lays her eggs in the cranberry, and then cuts off the stem. The grape curculio (*Cœliodes inæqualis*) and other species are very destructive to grapes. Fruit-trees and grapevines should be frequently shaken in summer, when the falling curculios may be caught upon a sheet and burned. Swine and sheep render great service by devouring the fallen fruit with the larvæ contained in it. Nearly 10,000 species of this family have been described. They are arranged in more than 630 genera.

Curculiou'idæ: See Weevil.

Curcuma: See Turmeric.

Curd: See Cheese.

Cures: an ancient and famous city of Italy; the capital of the Sabines; near the Tiber, about 25 miles N. N. E. of Rome. It was celebrated in the early history of Rome as the birthplace of Numa, as well as the city of Tatius. The site is occupied by the modern village of Correse. Cures was colonized by Sulla about 100 B. C. See Quirites.

Curfew Bell, or simply **Curfew** [O. Fr. *covre-feu*; *covrir*, cover + *feu*, fire < Lat. *focus*]: a bell rung at eight in the evening as a signal for extinguishing lights and fires—a practice said to have been introduced into England by William I. in 1068. As the custom existed in France, Spain, and other countries at the same time, it is probable that it was not originated by William I., but the strictness with which he compelled its observance caused it to be attributed to him. The stringency of this law was relaxed by Henry I. in 1103. In the reigns of Edward I. and Edward III. persons were not permitted to be abroad in the city, armed, after curfew. In many parts of England and the U. S. the practice of ringing the bell at eight or nine o'clock still prevails.

Curg, or **Coorg**: a province of Southern India; situated between lat. 11° 56′ and 12° 45′ N., and bounded by Mysore, Malabar, and South Kanara. Area, 1,583 sq. miles; pop., 180,461. The country is high and mountainous; its general elevation is about 3,000 feet above the level of the sea, and its highest peak, Tandiandamol, rises 5,781 feet. It is drained by the Kaveri, which rises on the eastern side of the Western Ghats, and a number of minor streams, which rise in the country itself, and during the rainy season carry great masses of water. Parts of the surface are covered with dense forests—teak, sandalwood, red and white cedar, ebony, etc.—with an undergrowth of cardamom, wild pepper, arums, and ferns. In the fields rice is cultivated and excellent fruit is raised, especially oranges. The fauna comprises the elephant, tiger, tiger-cat, hunting-leopard, wild-dog, elk, several species of deer, wild-boar, the cobra di capello, and the alligator. The inhabitants are of Dravidian origin, and speak a Canarese dialect. They are well formed, bold, and active, but ignorant and unskilled; the only manufacturing industry they have developed is a kind of coarse blankets used as garments. They are also superstitious, having retained the devil-worship of their ancestors. Polyandry and polygamy prevail among them, the wives of the brothers of a family being considered as common property. They were governed by independent rajahs of the Nair caste from 1583 to 1834, when the mismanagement of Viraraja caused Great Britain to interfere and annex the country.

Cu'ria (plu. **Curiæ**): the building in which the senate held its sessions in the cities of ancient Italy. Also a subdivision of the Roman patrician tribes, each of which was divided into ten *curiæ*. These tribes were three in number, the Ramnes, Tities, and Luceres, so that there were thirty curiæ. These curiæ contained only the patricians or *populus* proper, but clients were regarded as passive members of the curia of their superior. In early times the curiæ were of the greatest importance. Each curia had its own name, but only a few of these names have come down to us. In later times the curiæ lost their political importance, but long retained their ancient and mysterious religious rites, which were maintained by the priests called *curio* and *flamen curialis*. In still later times even these old offices were sometimes conferred upon plebeians. The curiæ voting together constituted the *comitia curiata*, once a highly important public body with legislative powers; but before the fall of the republic this body had fallen almost into disuse and oblivion, though it still had a formal existence. In it each of the curiæ had one vote, and in each curia each member had one vote. In the language of modern Europe, *curia* is the Latin word for court or place of justice.

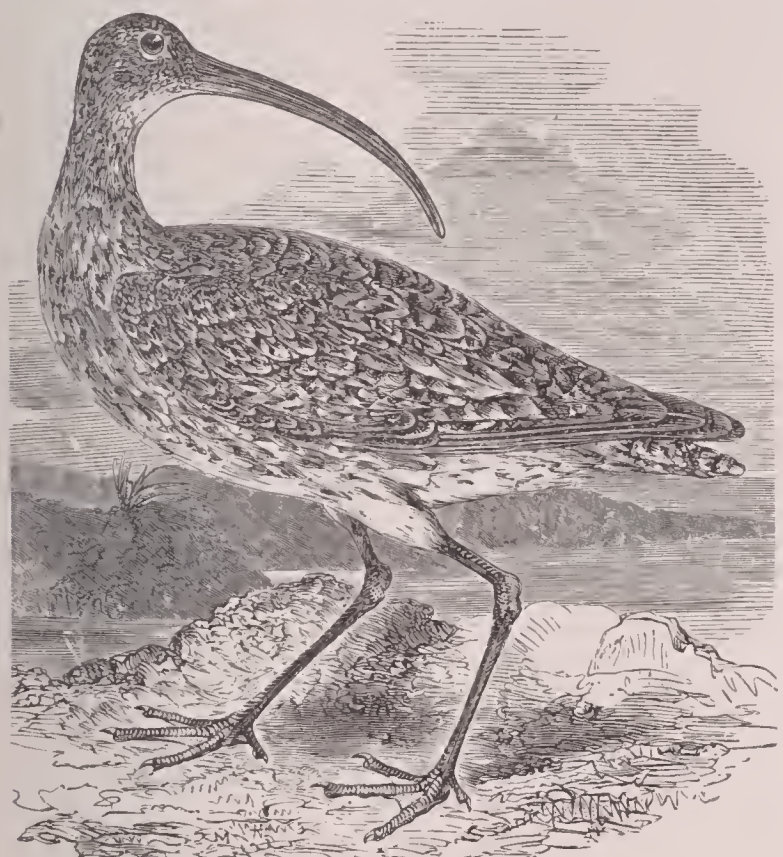
Curicó, koo-rĕē-kō′: a province of Chili; S. of Santiago, between Colchagua on the N. and Talca on the S., and extending from the Pacific to the summits of the Andes; area about 2,913 sq. miles. Capital, Curicó, with 10,110 inhabitants (1885). The western part is crossed by the coast chain, and the eastern is broken by spurs of the Andes. The central portion is a fertile plain, in which Curicó and some smaller towns are situated. Wheat-raising and grazing are the principal industries. The province was created in 1865 by a division of Colchagua. Pop. (1895) 103,242.

Herbert H. Smith.

Curicó: capital of the province of the same name; on the river Mataquito (see map of South America, ref. 8–C); founded in 1742. It is a progressive place, with a college. Pop. (1885) 10,110; (1895) 12,669.

Curitiba, koo-rēē-tee'băă: a city of Parana, Brazil; 80 miles W. of Paranaguá, with which it is connected by rail (see map of South America, ref. 7–F). It has manufactures and a large trade in maté. The German element in the population is large and the place is rapidly growing. Pop. 12,000.

Curlew: a bird of the genus *Numenius*, order *Limicolæ*, natives of Europe and North America. Curlews have long, slender, and curved bills, long legs, and short tails. They frequent the seashore and open moorlands, feeding on



European curlew.

worms, mollusks, insects, etc. The common curlew of England (*Numenius arquatus*) is pursued by sportsmen partly for its flesh, which is delicate and well flavored, and partly because its wild and shy habits render the pursuit exciting. Among the curlews of North America may be mentioned the long-billed curlew (*Numenius longirostris*) of all the temperate parts of North America. It is 25 inches long, the wing measuring about 11 inches. The bill is often 8 inches long. It is of a pale-reddish color, with ashy tints and brown-black marks, and longitudinal lines of black. The short-billed curlew (*Numenius hudsonicus*) of the Eastern and Western coasts is two-thirds the size of the foregoing, with a bill about 4 inches long. The Esquimaux curlew (*Numenius borealis*) is still smaller.

Curling: a game played upon the ice with polished teakettle-shaped stones weighing from 35 to 50 lb., the object being to plant the stone near the "tee," or center of a circle, at a distance of 40 yards or more, and to guard it there, or to drive out the stone of an opponent.

It is the national winter game of Scotland, but is now extensively played in the U. S. and Canada. It has been asserted that the game was introduced into Scotland from Flanders, but there is no evidence that it ever existed on the continent of Europe.

There is a tradition that James IV., who fell at Flodden, was a keen curler, and that Darnley in the severe winter of 1565 enjoyed many a game at Peebles. Be that as it may, it is certain the game has been practiced in Scotland for over three centuries, for a curling-stone bearing the date 1551 was found early in the nineteenth century in a pond which was drained near Dunblane. It was not dressed, but was just as it had been taken from the bed of the river, and had two holes in it where the handles had been. Another stone, with the date 1611, was found near the village of Torpichen, and a third was found at the bottom of Shiels loch with the date 1613 distinctly cut into it. Several stones of great age were found in the mud of a loch near Ardoch, which, although of very primitive appearance, had handles, as may be seen by this sketch of them.

Fig. 1.

Pennecuik, in his *Description* (published in 1715) of the customs of Peeblesshire, says of curling:

> To curl on the ice doth greatly please,
> Being a manly Scottish exercise.
> It clears the brains, stirs up the native heat,
> And gives a gallant appetite for meat;

and James Grahame, in his poem *The Sabbath*, gives an excellent description of the game.

The oldest curling club in existence is the Dudingston Curling Society of Edinburgh, instituted Jan. 17, 1795.

Matches of the most exciting interest take place in Scotland, not only between parishes but even counties, and sometimes the North and South of Scotland play against each other for the curling championship, the Forth being the dividing line. Nearly 2,000 players take part in these matches. The Royal Caledonian Curling Club of Seotland is the "mother" of all the curling clubs, and a recent report shows that some 660 clubs are now associated with it, directly or indirectly.

In 1866 twelve of the curling clubs of the U. S. organized the Grand National Curling Club of the U. S. It increased till some forty clubs became associated with it. As so many of them were in the Northwest it was deemed advisable in 1892 to organize a Northwestern Curling Association, covering all the territory N. W. of Ohio. Many of the clubs in the U. S. and Canada have excellent covered rinks, those of Toronto being especially large and substantial.

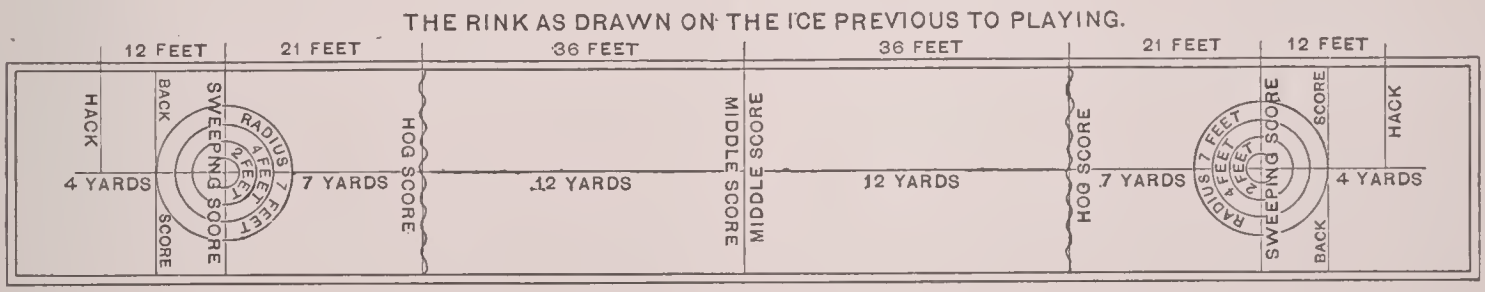


Fig. 2.

Curling is called the "roarin' game," not on account of the noise made by the players, but on account of the roaring sound made by the stones as they speed along the ice. This can be heard at quite a distance on a pond, or where the ice is made on a raised floor. A curling match is called a "bonspiel," a name which is, indeed, applied in Scotland to matches in other games, as in golf.

The game is essentially democratic. The lord of the manor, the clergyman, and the village blacksmith may be found on the same rink, with the smith in command, and implicit obedience to orders is always expected. Curling has always been free from "professionalism," and none of the evils attending so many manly pastimes have ever be-

come attached to this game. It is almost the only game which has an extensive and varied literature of its own. There have been over 300 songs written in its praise, and many sermons have received their most powerful applications from references to its practice.

For a diagram of the rink, see Fig. 2. The center of the rings is called the "tee." The stone may be delivered with an "in" turn or an "out" turn, that is, bringing the elbow in toward the body or out from the body, which gives an "English" to the right or left, and which makes the stone "curl" in or out, and hence perhaps comes the name of the game—"curling." A and B in Fig. 3.

Four on each side make a game, and the captain is called a "skip." In a large tournament the opposing clubs are divided into "fours," who play against each other. When a stone is delivered and is moving too slowly the skip calls on his men to "sweep, sweep" (in Scotch, "soop, soop"). After a rink has been swept many times it may be imagined that sweeping can be of little use, but it is held that a rapid motion of sweeping immediately in front of the running stone creates a vacuum which accelerates the motion of the stone by the air rushing in from behind.

There is no limit to the variety of shots played, and in this it is very different from quoits and is more like billiards. Sometimes the player must "draw" a quiet shot to place the stone on the tee; sometimes he is called on to "guard" or lay a stone in front to protect a winning stone; again, he may be asked to play a swift shot to break the guards off, or run a narrow port; then he may have to inwick or outwick (carom) off a stone at the side, and curl in upon the tee or run a winner out. The game can hardly be made intelligible by a printed description. It has to be seen to be understood.

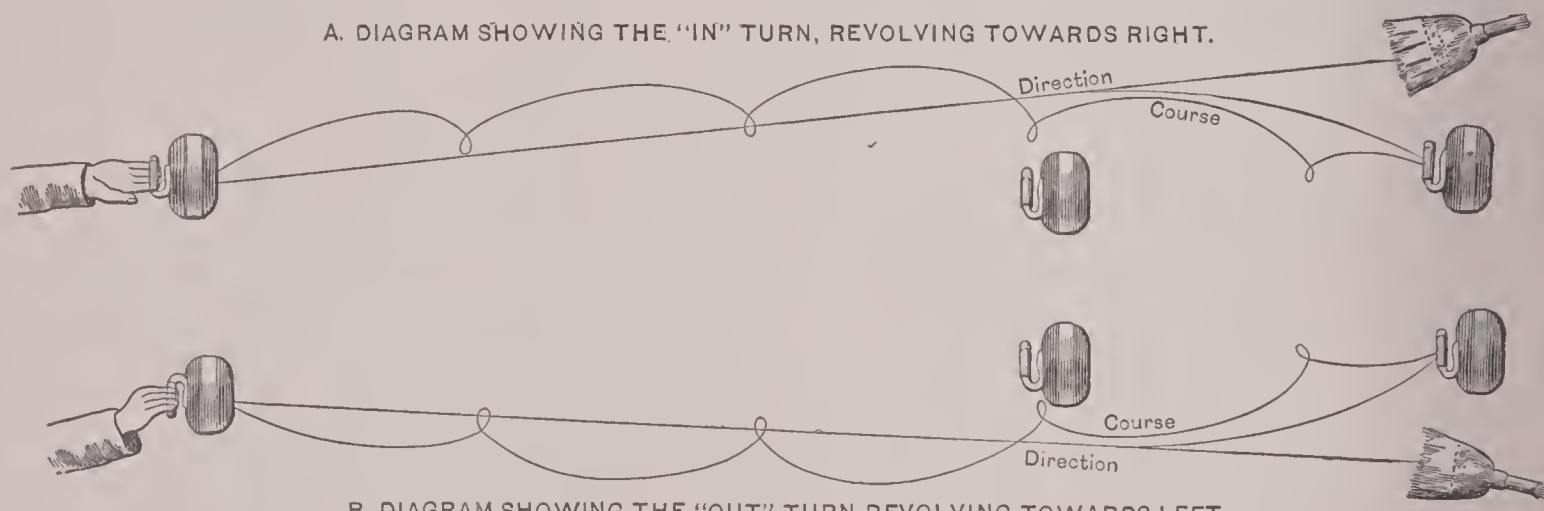


FIG. 3.

The following is a summary of the rules as laid down by the Northwestern Curling Association of America, which do not differ materially from those of the Royal Caledonian and Grand National Curling Clubs:

The standard length of the rink for play is 42 yards from hack to tee. The tees are 38 yards apart, and around each, as a center, is a circle of 7 feet radius, which is called the "home" or "ring." To facilitate measurements, intermediate circles are also described around the tee. Every stone within or resting upon the outer ring is entitled to be counted in the game; no stone is considered without a circle unless it is entirely clear of that circle, nor is a stone considered over a line unless it has crossed and entirely cleared it. This is decided by a square placed upon the ice. From, and in exact alignment with both tees, a line, called the center line, is drawn to a point 4 yards behind each tee; at this point a line is drawn at a right angle to the center line on which the hack is cut. The hack does not exceed 6 inches in length, nor is the inner edge thereof more than 3 inches from the center line, so that all stones are delivered with their center upon the center line. Other lines, called the middle score, the hog score, the sweeping score, and back score, are drawn on the ice at right angles to the center line. The middle score is drawn midway between the two tees, to point out the place at which sweeping may ordinarily be commenced. The hog score is drawn at a distance from each tee of one-sixth of the length from hack to further tee, and indicates the point at which, if a played stone fails to pass, it is counted a hog, and removed from the ice, unless prevented from passing by striking another played stone resting inside the hog score. The sweeping score is drawn across the tees for the guidance of the skips in sweeping. The back score is drawn just outside and behind the 14-foot circle around the tee (the home); all stones that have passed this score are removed. Matches consist of the majority of shots won, after playing a certain number of heads or definite period of time. In the event of both parties being equal at the conclusion of the match play is continued for another head, or for such additional number of heads as may be necessary to decide the match. Every rink is composed of four players a side, each using two stones, and playing one stone alternately with his opponent. The rotation of players observed in the first head is not changed. The two skips opposing each other settle by lot, or in any other way they may agree upon, which party leads in the first head, after which the winning party leads. The skips have the exclusive management of the game for their respective parties, and may play last or in any part of the game they please, but are not entitled to change their places when once fixed. When their turn to play comes they appoint one of their players to act in their places as skips of the game, and take the position of ordinary players until they have played and returned to the tee-head as skips. Players are arranged along the sides, but well off the rink, as their skips may direct; and no party, except when sweeping according to rule, can go upon the middle of the rink. Skips alone stand within the 14-foot circle or home; the skip of the party playing has the choice of place, and must not be obstructed by the other in front of the tee, while behind it, the privilege of both as regards sweeping being equal. Every player must be ready when his turn comes, and must not take more than a reasonable time to play. Should he play a stone belonging to another, any of the players may stop it while running; but if not stopped till at rest, the stone which should have been played may be put in its place to the satisfaction of the opposing skip. If a player plays out of turn, the stone so played may be stopped in its course and returned to the player; should the mistake not be discovered till the stone is at rest, or has struck another, the opposing skip shall add one to the score and have the option of allowing the game to proceed or declaring the end to be null and void. But if another stone be played before the mistake has been noticed, the end must be finished, as if it had been played properly from the beginning. If any player engaged, or belonging to either of the competing clubs, speaks to, taunts, or otherwise interrupts any other player not of his own party, while preparing to play his stone, and so as to disconcert him, one shot is added to the score of the party so interrupted for each interruption. If in sweeping, or otherwise, a *running* stone be marred by any of the party to which it belongs, it is put off the ice and the opposing skip has the option to add one to his score and allow the game to proceed, or to call the end null and void; but if marred by any of the adverse party it is placed wherever the party to which it belongs may direct. If marred by any other means, the player replays the stone. Should any played stone be displaced by any of the players before the head is reckoned, it shall be placed as near as possible where it lay, to the satisfaction of or by the skip opposed to the party displacing it. If displaced by any neutral party, both skips agree upon the

position to which it is to be returned, and if they fail to agree, the umpire decides. The sweeping is under the direction and control of the skips. It is not allowable for the party to whom a running stone belongs to place a broom before it or behind it to screen it from the wind, unless with the consent of both skips. The use of a broom or any other instrument as a fan, either to promote or retard the running of a stone, is strictly forbidden. All stones are circular in shape, and none, including the handle, is of a greater weight than 50 lb., or of a greater circumference than 36 inches, or of a less height than one-eighth of its greatest circumference. No stone or side of a stone can be changed more than once after a match has been begun, unless with the consent of the opposing skip. Should a played stone roll over or stop on its edge or top, it is put off the ice. Should the handle quit the stone in delivery, the player is not entitled to replay the stone unless he retains hold of the handle. No measuring of shots is allowed previous to the termination of the end. Disputed shots are determined by the vice-skips; or, if they disagree, by the umpire; or, if there is no umpire, by some neutral person chosen by the skips. If any of the competing rinks are not ready to begin play at the hour named for a match, one end is counted as played for every ten minutes' delay; and the opposing rink, if ready to play, counts one point in the game for each such period of time it is kept waiting. JOHN JOHNSTON.

Curran, CHARLES COURTNEY: genre-painter; b. at Frankfort, Ky., Feb. 13, 1861. Pupil of Art Students' League, New York, and of Doucet, Lefèbvre, and Benjamin-Constant, Paris; member Society of American Artists 1888; associate of National Academy; third Hallgarten Prize, N. A. D., 1888; honorable mention, Paris Salon, 1890. His pictures are good in drawing and cleverly composed. Represented in the permanent collections of Chicago Art Institute, Columbus (Ohio) Art Gallery, and Vassar College. Studio in New York. WILLIAM A. COFFIN.

Curran, JOHN PHILPOT: an Irish orator; b. at Newmarket, near Cork, July 24, 1750; was educated at Trinity College, Dublin; studied law in the Middle Temple, London; and was called to the Irish bar in 1775. As a barrister he was very successful, and was distinguished for his humor and sarcastic speech. He became in 1783 a member of Parliament, in which he acted with the opposition party, of which Grattan was the leader. In 1806 he was appointed master of the rolls of Ireland. D. in London, Oct. 14, 1817. See Charles Phillips, *Curran and his Contemporaries* (1850); T. Davis, *Life of Curran* (1846).

Currant [Fr. *raisins de Corinthe*, because Corinth was the chief port of exportation]: a kind of small raisin (*Uva passula minor*), the dried berry of a seedless variety of grape which is cultivated in the Levant. Currants are exported from Zante and some of the other Ionian islands, and are used in cookery as an ingredient in cakes and puddings. The staple currants quoted in market reports are these seedless grapes.

Currant: the popular name of the berries of certain species of *Ribes*, low shrubs of the order *Grossulaceæ*, distinguished from the gooseberries by the flowers, which grow in racemes, and by the fact that the currant bush is never thorny. The red currant (*Ribes rubrum*) is a native of Europe, Asia, and North America, is cultivated in gardens for its pleasant acid fruit, and is much used for the table and for jellies, conserves, etc. "Currant wine" is a domestic drink, made of currant juice, sugar, and water, which is allowed to undergo alcoholic fermentation. The black currant (*Ribes nigrum*), a native of Europe and the north of Asia, is also cultivated, and in France large quantities of *liqueur de cassis*, a very agreeable and popular variety of currant wine, are prepared from it. More than sixty species of currants are described, about two-thirds of which are American. Several are highly ornamental in cultivation. Tho varieties of fruit-bearing currants in cultivation are very numerous. They are very readily propagated by cuttings. The most popular market varieties in the U. S. are Victoria, Cherry, La Versailles, Fay, among the reds; White Grape among the whites; and Black Naples among the blacks.

Currency: the circulating medium, or the aggregate of means used for settlement of debts and commercial transactions. The term is a somewhat loose one, modern writers not being agreed whether bank checks or even bank deposits should be regarded as currency. In general, there is a disposition to apply the terms currency and money to the same things, the individual coin or bill being spoken of as money, and the aggregate of such coins or bills constituting the currency. Hence we speak of the value of money, but of the inflation of the currency. Currency in modern states consists of four parts: (1) Metallic money under free coinage, with full legal tender. The gold currency of the U. S. is of this character. (2) Metallic money without free coinage, but with full legal tender. The silver dollars coined in the U. S. are of this sort. (3) Subsidiary coinage or small change, whose bullion value is almost never made equal to its nominal value, and which does not, as a rule, have the legal-tender character. (4) Paper money of various kinds, whether it be certificates of deposit, promises to pay with a legal-tender character, like GREENBACKS (*q. v.*), or promises without such character, like the U. S. national bank-notes. The first and the fourth constitute by far the most important elements.

If a nation attempts to use different forms of currency at the same time, that which has less intrinsic value in the markets of the world will always remain at home, while that which is more valuable will be liable to export. If clipped coin circulates side by side with good coin, the clipped coin will stay at home and the good coin will go abroad. If two different metals are side by side in circulation, free coinage of the less valuable metal will drive the other out wholly, and a restricted coinage of the less valuable metal will drive the other out to some extent. In the U. S. a gold dollar and a silver dollar are at present worth the same amount. For export a gold dollar is worth about 50 per cent. more than a silver dollar. If, therefore, a change in the balance of trade causes the export of money, gold dollars will be exported, and not silver dollars. The fact was first discovered by Sir Thomas Gresham in the reign of Queen Elizabeth, and is known as Gresham's law.

During the early history of the U. S. an attempt was made to employ gold and silver side by side, at a ratio of 15 to 1, the silver dollar having $371\frac{1}{4}$ grains of pure metal and the gold dollar $24\frac{3}{4}$ grains, free coinage of both metals existing at the same time. But $24\frac{3}{4}$ grains of gold was more valuable in the markets of the world than $371\frac{1}{4}$ grains of silver. In consequence of this, people preferred to pay their debts in silver dollars and to use the gold for export. Down to the reform of the currency in 1834, the U. S. used silver only, but, its bulk rendering it inconvenient for large transactions, a change was made by which the ratio of 16 to 1, or, more accurately, 15·98 to 1, was adopted, and the gold dollar reduced to 23·2 grains of pure metal. (See COINAGE.) It happened at this time that the conditions of gold and silver production were such that in the markets of the world the ratio between the two metals was about $15\frac{1}{2}$ to 1. Twenty-three and two-tenths grains of gold was worth less at that time than $371\frac{1}{4}$ grains of silver. The result of this was that people preferred to pay their debts in gold dollars. The silver dollars were exported as bullion, and gold was coined in their place to the necessary amounts. Any business man could make a profit by selling the silver dollar in England as bullion, buying the corresponding amount of gold with it, and having a little less than that amount of gold coined into a dollar, leaving a slight surplus due to the difference between the bullion and the coining value of the metals. The fractional coinage was retained in the U. S. only because it was made of less than the full weight, two halves weighing much less than one dollar. During the period from 1834 to 1873 the coinage both of gold and silver was nominally free, but as the silver was at that time worth more to export than to coin, there was no actual use of silver except for fractional currency. By the act of 1873 the free coinage of silver ceased. See SILVER.

During a large part of this period comparatively little gold or silver was in actual use. Its place was taken in the currency of the U. S. by paper money; sometimes by U. S. bank issues, sometimes by those of State banks. Neither of these experiments was thoroughly successful. The successive U. S. banks fell into discredit, and became the subject of party contentions, culminating in the withdrawal of support by President Jackson in 1833 and the notorious disaster that followed. State bank-notes were worse than U. S. bank-notes, because of the absolute lack of security or proper examination. The currency was inflated by these agencies in times of speculation, and when the disaster followed the notes were worthless and the distress was intensified. (See COMMERCIAL CRISES.) As an antidote for all these evils the national banking system grew up in the years 1863–65.

Meantime, under the war exigencies, the U. S. had been issuing legal-tender notes, or greenbacks, on an enormous scale, completely driving out the gold currency, in accordance with Gresham's law, and then issuing an excess of unnecessary paper money to such a degree as to constitute an inflation. (See below.) In 1863 a paper dollar was worth decidedly less than a gold dollar. In 1864 it was at the lowest point, worth only 43 cents. The restoration of confidence at the close of the war brought the value of a paper dollar up to between 70 and 80 cents, but, the amount of paper money continuing excessive, no gold or silver was used for ordinary purposes of trade for many years afterward. The efforts of Secretary McCulloch to contract the currency in such a way as to bring greenbacks to a par with gold provoked widespread opposition and threats of further inflation. It was not until 1874 that arrangements were made for the resumption of specie payments. Though the law was conceived somewhat at haphazard, a succession of favorable events in the commercial world, combined with the skill of Secretary Sherman, enabled the Treasury to accumulate such a reserve that at the time appointed for resumption of specie payments, Jan. 1, 1879, there was no contraction whatever and no presentation of greenbacks for redemption.

Fractional silver came into use in the place of the fractional currency in 1876. Silver dollars were coined by the act of 1878 at the rate of 2,000,000 a month. By the act of 1890 (repealed in 1893) this was about doubled. (See SILVER.) Much of the silver coinage lies in the Treasury. Certificates of deposit for such coin or silver certificates circulate in their place, while since 1890 notes are in circulation on the basis of uncoined silver lying in the Treasury. There are also gold certificates and legal-tender certificates, representing similar deposits of gold or greenbacks in the Treasury, the sole purpose of the latter being to substitute notes of very large denominations in place of small ones. The currency of the U. S. at various periods has been as follows:

July 1, 1860.—Specie, $235,000,000; State bank-notes, $207,000,000: total, $442,000,000.

July 1, 1865.—Specie (Pacific coast), $25,000,000; State bank-notes, $143,000,000; fractional currency, $25,000,000; U. S. notes, $431,000,000; national bank-notes, $146,000,000: total, $770,000,000 (of which $55,000,000 was in the U. S. Treasury).

July 1, 1870.—Specie (Pacific coast), $25,000,000; State bank-notes, $2,000,000; fractional currency, $40,000,000; U. S. notes, $356,000,000; national bank-notes, $301,000,000: total, $723,000,000 (of which $48,000,000 was in the U. S. Treasury).

July 1, 1875.—Specie (Pacific coast), $25,000,000; State bank-notes, $1,000,000; fractional currency, $42,000,000; U. S. notes, $376,000,000; national bank-notes, $354,000,000: total, $798,000,000 (of which $44,000,000 was in the U. S. Treasury).

DIVISIONS.	JULY 1, MILLIONS OF DOLLARS.		
	1880.	1885.	1890.
Gold coin	351·8	588·6	695·5
Silver dollars	69·6	208·5	380·0
Subsidiary silver	72·8	74·9	76·8
Gold certificates	8·0	140·3	157·5
Silver certificates	12·3	139·9	301·5
U. S. notes	346·6	346·6	346·6
National bank-notes	344·5	318·5	185·9
Totals	1,205·9	1,817·6	2,144·2
Of which there was in the Treasury	232·5	525·0	714·9
In circulation	973·3	1,292·5	1,429·2
Circulation per capita	19·41	23·02	22·82

DIVISIONS.	JULY 1, 1900, MILLIONS OF DOLLARS.		
	General stock.	In Treasury.	In circulation.
Gold coin	833·6	610·8	222·8
Silver dollars	81·6	65·8	15·7
Subsidiary silver	82·8	76·1	6·7
Gold certificates	200·7	200·7	.....
Silver certificates	408·4	408·4	.....
Treasury notes (act of 1890)	76·0	75·3	0·7
U. S. notes	346·6	313·9	29·0
Currency certificates (act of 1872)	3·7	3·7	.....
National bank-notes	309·6	300·1	9·5
Totals	2,343·0	2,055·1	284·5
Circulation per capita, $26.94.			

The currency of Great Britain consists of gold, subsidiary silver, and Bank of England notes, with a few notes of local banks, not having much importance for the general circulation. Of the Bank of England notes, £15,000,000 are based on securities held by the bank itself, and in this respect are somewhat like national bank-notes. All notes in excess of that amount are secured, pound for pound, by coin in the vaults of the bank, and are, to all intents and purposes, analogous to the gold certificates of the U. S. The Government does not use paper money of its own. The currency of France consists mainly of gold, under a system of free coinage and legal tender, with a good deal of silver having the legal-tender character, but not free coinage. Notes are issued by the Bank of France in very considerable amounts, but without the restrictions as to reserve that govern the Bank of England. The currency of Germany is like that of France, without the legal-tender silver. Russia has a depreciated paper currency. Austria and Italy have a paper currency, but on a much sounder basis than that of Russia. The volume of currency in different states of the world at the end of 1885 was estimated by Haupt to be as follows:

COUNTRIES.	MILLIONS OF DOLLARS.					
	Gold.	Standard silver.	Fractional silver.	Copper and nickel.	Paper in excess of reserve.	Total.
United States	604	211	72	14	302	1,206
Great Britain	513	...	101	7	56	677
France	831	653	47	11	126	1,667
Germany	429	105	103	10	117	764
Austria	37	56	13	5	187	299
Russia	180	7	35	5	311	537
Italy	105	19	32	14	159	327
India	...	757	...	..	...	757
China	...	700	...	..	...	700
And for the world as a whole	3,447	3,033	539	92	1,710	8,820

Inflation and Depreciation of the Currency.—Whatever is used as a general medium of exchange naturally serves as a measure of value. A man will not commonly speak of a ton of coal as worth five bushels of wheat, because he does not actually exchange one for the other; but will speak of a ton of coal as worth $5 or a bushel of wheat as worth $1. Money thus becomes the general measure of debts and obligations, and this in civilized states grows to be its most important function. In the older contracts, for instance, in England in the eleventh, twelfth, and thirteenth centuries, and in the feudal obligations of the same time, the services are found measured either in day's labor, bushels of wheat, or provender for horses, and each man's obligations were fixed in this way long after money had come into frequent use. But from the thirteenth to the fifteenth centuries there was a commutation of labor dues or dues in kind, for money payments, so that a man held his land not in virtue of so many days' service per year, but of so many pence or shillings per year. When money became so important a feature in contracts one of its chief uses was to pay interest or principal on debts; and the question whether anything was or was not money came to depend not so much on its acceptability as on the question whether the Government and the courts made it a legal tender for the discharge of such debt. This legal tender might also vary in value from time to time. Sometimes, either by the debasement of the coin itself or by the issue of paper money and other substitutes for the metals, it would depreciate, and the amount of work necessary for the discharge of a debt be less than was at first contemplated; sometimes, though less frequently, money would become scarcer and the quantity of labor necessary to discharge a debt greater.

The value of money, like that of anything else, depends upon supply and demand. (See POLITICAL ECONOMY.) Anything which increases the amount of money while the amount of transactions remains the same will diminish the value of money or increase the value of everything else measured in money. In other words, it will raise prices. Conversely, anything which diminishes the amount of money while the transactions remain the same, or increases the amount of transaction while the supply and the circulation of money are not increased, will tend to lower prices. It should be observed that it is not the quantity of money alone which enters into this calculation, but the quantity of money and the rapidity of circulation. A small amount of money in a country with a good banking system may go further than a much larger amount of money where payments have

to be made from hand to hand by old cumbersome methods; but with this reservation, the relation between quantity of money and quantity of work to be done by that money determines prices. An increase in the number of dollars will make a dollar purchase less goods; or, to put the matter in another way, inflation of the currency raises prices all around.

The danger of "fiat money" or light weight money, or any other money not used by other nations with whom the U. S. deal, lies in the liability to inflation by act of Congress. If the Government takes a certain number of grains out of every dollar and at the same time coins no more dollars than would otherwise have been issued, the value of a dollar may for a long time remain unchanged. Or if the Government substitutes paper dollars which have no intrinsic value for metallic dollars which have a great intrinsic value, prices may remain nearly unchanged as long as the issue is strictly limited to the old amount. Such a case was seen in France during the war of 1870, where the displacement of gold and silver by paper did not have a corresponding effect in prices, nor cause a large gold premium, because the Bank of France restricted its issue to the amount actually needed. Somewhat the same course of events is seen in the U. S. to-day, where the debasement of the silver dollar has not produced a gold premium, because the issue of silver and paper dollars has not as yet been sufficient to drive out the gold currency. But such self-restraint rarely lasts for a long time. A debased currency is demanded, as a rule, from one of two causes: either by the Government officials in some fiscal exigency where they want to issue as many dollars as they can, or by debtors as a class where they wish to have the currency depreciated. Under the operation of these causes excessive issues are almost inevitable when debasement or recourse to irredeemable paper has once begun.

With a gold currency, or a currency composed of gold, silver, and paper together, the fall in the value of a dollar is limited by international trade. If for any cause there is an increased issue of money and it begins to drive prices up a little, the U. S. become a good place to sell in and a bad place to buy in. Persons engaged in foreign trade therefore will send more goods to the U. S. than would otherwise be the case and export fewer goods to pay for them. There will thus be an export of gold and a diminution in the amount of money to counteract the excessive issues. If, on the other hand, owing to the exigencies of moving the crops or any other set of special causes, commercial or fiscal, there becomes a scarcity of money, the U. S. become a good place in which to buy goods and a relatively bad place for selling them. Under such conditions the U. S. export more than they import, and receive gold in partial payment of the difference. The demand for additional quantity thus adjusts itself by international trade, and the U. S. is not subject to variations of value of money and alternate periods of stringency and ease which characterized the years preceding the Resumption Act.

If the gold currency were driven out and silver were alone the medium of exchange, the case would be different. The bullion value of the silver dollar in the markets of the world is less than that of the gold dollar. If, therefore, an increased issue of silver dollars should drive prices up, there would be no demand for exportation of our excess, and the depreciation of the currency or, what is the same thing, the increase of prices might go on until the value of a dollar came down to the limit of the worth of the silver bullion which it contains in the markets of the world. Under silver currency, however, there would be ultimately such a limit, because silver has great utility and considerable cost of production, and the limit of inflation and consequent depreciation of prices would be furnished by the utility and the cost of production of 371 grains of silver, the amount of pure metal in a dollar. With paper there is no such limit. The issue of greenbacks is limited only by the self-restraint of Congress, and how little one can depend on that self-restraint in political exigencies is only too well known. In the time of the civil war issues of greenbacks were crowded to such an excess that a greenback dollar was worth little over a third as much as a gold dollar, with the consequent disturbance of prices and loss to the Government as a purchaser of supplies, which probably more than outweighed any fiscal advantage gained from the issue of paper money. In the Confederate States in the civil war, or in the whole country during the Revolution, the issue of paper money went very much further, so that transactions were often practically reduced to a system of barter, and all industry crippled even more than is inevitable under the stress of a war. The history of nations in general shows that very few, even of the wisest, can be trusted with the dangerous expedient of issuing irredeemable paper money as a legal tender for the payment of debts. It may be thought that the debtors, as a class, gain by such an issue as much as the creditors lose, and that therefore the effect of varying values is not so bad as would appear. This is a mistake. Whatever the debtor may temporarily gain by the scaling down of debts is lost by diminished power of borrowing money in the future. To borrow money for purposes of investment is for the advantage of debtor and creditor alike, but especially of the former, since he is able to take advantage of exceptional natural opportunities which would otherwise be lost to him. Anything which makes the payment of debts more uncertain makes borrowing more difficult, if not absolutely impossible. The creditor will secure protection by the charge of an exorbitant rate of interest, which more than outweighs any possible gain from the depreciation in those cases where loans are made, and in the majority of cases no loans will be made at all, and development of the country will be interfered with.

The foregoing criticisms apply chiefly to the issue of irredeemable paper by the Government. Redeemable paper, especially if not legal tender, is not subject to these dangers. It is more convenient to handle in large sums than gold or silver. It economizes the wear of the coin and prevents, to some extent, the necessity of keeping large masses of coin idle. Such paper may be issued either by the Government or by banks. If the Government issues it, there is perhaps a certain saving of interest to the people, but this advantage is, as a rule, more than counterbalanced by the danger of the abuse of this issuing. If it is in the hands of the banks it is not so liable to abuse. The banks can not declare their notes a legal tender; they can not fail to redeem them without at once having their affairs wound up. More than that, the issue of bank-notes enables the currency of the country to adapt itself, in some measure, to the volume of local business more readily perhaps than would be the case with gold or silver. (See BANKS.) But even under the best banking system there is great danger of the abuse of the issue of paper money. Any gain in economizing the use of coin is more than counterbalanced by danger of undue expansion of the credit system, and of failure of the reserves just when they are most needed by it in a war or in a crisis, for bank-notes ordinarily displace in the use of the nation an almost equivalent amount of metallic currency, and have the effect of making business depend too much upon credit and too little upon cash reserves. There is a large school of writers that believes that paper money should be of the nature of gold or silver certificates; in other words, that every dollar of paper should represent a metallic dollar held actually in reserve somewhere, and that any economy due to the adoption of more moderate reserves is outweighed by the danger which it causes.

See Jevons, *Money and the Mechanism of Exchange*; F. A. Walker, *Political Economy*, for general principles, and for further details the same author's work on *Money*. See also articles on BANKS, COINAGE (for the value of money of different nations), MONEY, and SILVER.

ARTHUR T. HADLEY.

Current: in electricity, a term of convenience to indicate the process by which equalization of electrical potential in conductors takes place. For a description of the phenomena which accompany this process, such as the development of heat in the circuit, electrolysis, the establishment of a magnetic field in the surrounding medium, etc., see ALTERNATE CURRENTS and ELECTRICITY; for means of producing current, see BATTERY and DYNAMO-ELECTRIC MACHINES; and for methods of measuring current, see GALVANOMETERS.

E. L. NICHOLS.

Current-meter: a wheel driven by the motion of the water and which, placed in a stream, records its velocity by means of the number of revolutions of the wheel. The simplest form is a small paddle-wheel, but this can determine only the velocity of the surface. The self-recording instruments devised by Woltmann, Brewster, Saxton, and others are arranged like a windmill, so that the plane of the wheel is perpendicular to the current. The modern forms of these current-meters have electric attachments which communicate with a recording apparatus on shore or in a boat. The current-meter is the most accurate instrument

for determining the mean velocity of a river or canal. To derive the velocity from the number of recorded revolutions per second, the meter must be first rated by pushing it at a known velocity in still water. It is usually found that the number of revolutions is not exactly proportional to the actual velocities of the boat, but the relation being ascertained for different speeds the corrections to be applied in subsequent work are thus known.

MANSFIELD MERRIMAN.

Current River: of Missouri and Arkansas; rises in Texas co., Mo.; flows southeastward into Arkansas, and enters the Black river in Randolph County. Length, estimated at 250 miles. It is a remarkably clear stream, abounding in fish of good quality. It is navigated by flatboats and steamers to some extent. Jack's Fork enters the main stream from the W. in Shannon co., Mo., and steamboats can ascend nearly to the union of the forks in good stages. The river flows through a hilly mineral region.

Currents, MARINE: See OCEAN and GULF STREAM.

Currer Bell: See BRONTÉ, CHARLOTTE.

Currie, JAMES, M. D.: b. at Kirkpatrick Fleming, in Dumfriesshire, Scotland, May 31, 1756. He was destined for mercantile business, and sent out to Virginia while still very young. After the outbreak of the Revolutionary war, however, he returned to Scotland, studied medicine in Glasgow, and settled in 1780 in Liverpool as a physician. His *Medical Reports on the Effects of Water, Cold and Warm, as a Remedy in Fevers and other Diseases*, ran through several editions, but he is best known by his edition of Burns's works (1800). D. in Liverpool, Aug. 31, 1805.

Currie, JOHN, D. D.: theologian; b. in Tatamagouche, Colchester co., Nova Scotia, Dec. 22, 1828; educated at the home grammar school, at Pictou Academy, and in Edinburgh, Scotland. He was a teacher in the public schools of Nova Scotia for eight years, pastor of a Presbyterian church in Maitland, Nova Scotia, for fourteen years, and from 1871 Professor of Hebrew and Exegesis in the Presbyterian Theological College at Halifax. He is a thoughtful and scholarly writer of articles on exegetical subjects and subjects connected with theological study. WILLIS J. BEECHER.

Curry, DANIEL, D. D., LL. D.: Methodist divine and journalist; b. near Peekskill, N. Y., Nov. 26, 1809; graduated at the Wesleyan University, Connecticut, in 1837; was the same year principal of Troy Conference Academy; entered the ministry in Georgia in 1841; and occupied pulpits in Athens, Savannah, and Columbus, S. C. He returned to the North after the division of his denomination through the slavery controversy, and joined the New York Conference; had pastoral charge of important churches in New York and other cities; was three years president of the Indiana Asbury University (1854–57), at Greencastle, Ind.; resumed his labors in the East; contributed largely and ably to the periodical literature of his Church, and in 1864 was appointed editor of its chief official journal, *The Christian Advocate*, New York city, which office he held till 1876. He was editor of the *National Repository* (1876–80), associate editor of the *Methodist Review* (1881–84), and chief from 1884 till his death in 1887. He was author of a *Life of Wycliff* (New York, 1846); *New York, the Metropolitan City of America*, an historical sketch (New York, 1853); *Life Story of Bishop D. W. Clark* (1873); *Fragments, Religious and Theological* (1880); *Platform Papers* (1880); *The Book of Job*, a commentary (1888). He edited Southey's *Life of Wesley* (2 vols., 1852); the works of Rev. Dr. James Floy (2 vols., 1863), and Adam Clarke's *Commentary on the New Testament* (2 vols., 1882–84). D. in New York city, Aug. 17, 1887. Revised by JOHN F. HURST.

Curry, JABEZ LAMAR MONROE, D. D. (1871), LL. D. (1867): statesman, educator, and diplomat; b. in Lincoln co., Ga., June 5, 1825; educated in the University of Georgia and at Dane Law School, Harvard College, graduating at the former in 1843 and at the latter in 1845; member of the lower house in the Legislature of Alabama; member of the electoral college that cast the vote of Alabama for Buchanan and Breckinridge in 1856; member of the U. S. House of Representatives from Alabama, from 1857 to 1861; aide to Gen. Johnston while in command in Georgia; lieutenant-colonel of cavalry; president of Howard College, Alabama (1866–68); president of Alabama Baptist State convention; president of the Foreign Mission Board of Southern Baptist convention; president of the board of trustees of Richmond College; member of the House of Representatives in the Confederate Congress; Professor of English Literature, Philosophy, and of Constitutional and International Law in Richmond College 1868–81; envoy extraordinary and minister plenipotentiary to Spain 1885–88; general agent and honorary trustee of the Peabody education fund 1881–85; trustee and chairman of educational committee of the John F. Slater fund. Dr. Curry's publications include reports of Peabody education and of John F. Slater funds, numerous addresses, *Constitutional Government in Spain* (New York, 1889); and *William Ewart Gladstone, a Study* (Richmond, Va., 1891). W. H. WHITSITT.

Curso'res [Lat., the runners, deriv. of *cur'rere, cursus*, run]: an order of birds comprising the ostrich and allied forms (see BREVIPENNES); also sometimes used for a group containing many of the wading birds. In entomology, cursores is applied to certain spiders which capture their prey by running—the wolf-spiders (*Lycosidæ*). F. A. L.

Curtein, or **Curtana** [Anglo-Fr. *curtein*; Mediæv. Lat. *curtana* < Lat. *curtus*, broken off]: the name originally given to the sword of ROLAND (*q. v.*), the point of which broke off when it was first tested. The name has since been given to the pointless sword carried, as the emblem of mercy, before the sovereigns of England at their coronation.

Curtin, ANDREW GREGG: Governor of Pennsylvania: b. Apr. 22, 1817; son of Roland Curtin, one of the earliest iron manufacturers in Centre County, who removed to the U. S. from Ireland in 1793. He studied law in Dickinson College, canvassed the State in 1844 for Henry Clay, was appointed secretary of the commonwealth in 1854, was elected Governor in 1860, and displayed great energy and promptitude when the first call for troops came at the opening of the civil war. In 1863 he was re-elected by a large majority, and in 1869 was appointed minister to St. Petersburg; was member of constitutional convention of Pennsylvania; joined the Democratic party, and was elected to the 47th, 48th, and 49th Congresses. D. at Bellefonte, Pa., Oct. 7, 1894.

Curtis, BENJAMIN ROBBINS, LL. D.: lawyer; b. in Watertown, Mass., Nov. 4, 1809; graduated at Harvard in 1829, and was admitted to the bar in 1832, after which he practiced law in Boston. He was appointed a judge of the Supreme Court of the U. S. in 1851, but he resigned that office in 1857. He was one of the counsel who defended President Johnson in his trial before the Senate, in Apr., 1868. He was the author of several volumes of legal reports. D. at Newport, R. I., Sept. 15, 1874. See his *Life and Writings*, edited by his son.

Curtis, EDWARD, A. B., M. D.: physician; b. in Providence, R. I., June 4, 1838; was educated in New York; graduated in 1859 at Harvard College; studied medicine at the University of Pennsylvania, where he took his degree in 1861; served in the regular army as a surgeon 1861–70; was appointed Professor of Materia Medica and Therapeutics at Columbia College, New York, in 1872; has devoted himself much to the study of photographing microscopic objects by means of the microscope, and has published various papers on the subject.

Curtis, EDWARD LEWIS, D. D.: theologian; b. at Ann Arbor, Mich., Oct. 13, 1853; graduated at Yale College 1874, and at Union Theological Seminary 1879, winning a fellowship. He studied in Germany, and on his return in 1881 became an instructor, and in 1884 Professor of Hebrew and Old Testament Literature in the McCormick Theological School. In 1891 he became professor in the same department in the Yale Divinity School. He has contributed to the reviews articles relating to biblical subjects. GEORGE P. FISHER.

Curtis, GEORGE HENRY: musician; b. in Troy, N. Y., 1819; attended Trinity School in New York city, under his elder brother, the Rev. John W. Curtis; began studying music against the wish of his parents, but persevered and became a good pianist, organist, and theoretical musician. His first important composition was the cantata *Eleutheria*, the text written by Horatio Stone. This work was produced in Apr., 1849. Mr. Curtis composed a number of songs and choruses to poems by Bryant, and a cantata on the subject of Julian the Apostate in 1878. This was never performed. He is the author of a number of school music books, and in 1884 published his *Prima Donna and Scenes from Real Life*. He was for thirty-four years a class teacher in the New York public schools. D. E. HERVEY.

Curtis, GEORGE TICKNOR: jurist; b. in Watertown, Mass., Nov. 28, 1812; graduated at Harvard in 1832; admitted to the bar in 1836, and practiced law in Boston. His works

include treatises *On the Rights and Duties of Merchant Seamen* (1841); *On the Law of Copyright* (1847); and a *History of the Origin, Formation, and Adoption of the Constitution of the United States* (2 vols., 1855–58); a *Life of Daniel Webster* (2 vols.); a *Life of James Buchanan* (1883); and *Creation or Evolution* (1887). D. in New York, Mar. 28, 1894.

Curtis, George William, LL. D., L. H. D.: author; b. in Providence, R. I., Feb. 24, 1824. After going to school for a time at Jamaica Plain, Mass., he removed with his father to New York, where he remained from 1839 to 1842. From 1842 to 1846 he worked on a farm, a portion of the time as a member of the Brook Farm Community at West Roxbury, where he was greatly influenced by the writings of Emerson. Going to Europe in 1846 he passed about four years in Italy, Germany, Syria, and Egypt. Returning to the U. S. in 1850, he was engaged for a time as one of the editorial staff of the New York *Tribune*. In 1852 he became one of the editors of *Putnam's Monthly*. In 1855 the magazine passed into the hands of a firm to which Mr. Curtis was admitted with pecuniary responsibility, but with no part in its commercial management. In the course of the next two years the house, having undertaken a general publishing business, and having become seriously involved in debt, was obliged to go into liquidation. Mr. Curtis, by means of his meager private fortune and his earnings, undertook the work of saving the creditors from loss. This he was finally able to accomplish, but it was not until he had devoted the efforts of sixteen years to the arduous task. In 1853 he began the remarkable series of papers in *Harper's Monthly* known as the *Easy Chair*. About the same time he entered the lecture field, and at once took rank as one of the most accomplished and popular lecturers of the day. In 1856 he first entered the field as a political speaker, and in the following year he became the leading editorial writer of *Harper's Weekly*, a position which he continued to hold till his death. He was a delegate to the Republican conventions in 1860, 1864, and 1876. In 1867, as delegate at large in the constitutional convention of the State of New York, he was chairman of the committee on education, and framed the constitutional provisions on the subject of education. In 1862 he declined the position of consul-general to Egypt offered him by President Lincoln. President Hayes, desiring to avail himself of Mr. Curtis's accomplishments, asked him, in 1877, to select a foreign mission, and a little later made him the specific offer of the mission to Germany. Both positions, however, were declined on account of the pecuniary sacrifices involved in a residence at one of the prominent European courts. In 1864 Mr. Curtis accepted the office of regent of the University of the State of New York, and in 1890 became chancellor. He was one of the first and most powerful, as well as most consistent, advocates of civil-service reform. Appointed by President Grant chairman of the commission to draw up new rules for appointment in the civil service, he soon resigned on account of differences between himself and the President in regard to the manner of applying the rules that had been adopted. At the organization of the National Civil Service Reform League he was chosen its president, and his annual addresses to the league were justly looked forward to as most important contributions to the literature of the subject. On all the political questions of the day he exerted a powerful influence; and though he was a voluminous writer it may be said he never wrote a line the influence of which was not elevating in its nature. All the products of his pen have a grace and beauty that give them a distinct place in literature. The esteem in which he was held by the most judicious of his contemporaries was well voiced by James Russell Lowell, who wrote:

> Had letters kept you, every wreath were yours;
> Had the world tempted, all its chariest doors
> Had swung on flattered hinges to admit
> Such high-bred manners, such good-natured wit;
> At courts, in senates, who so fit to serve?
> And both invited, but you would not swerve,
> All meaner prizes waiving, that you might
> In civic duty spend your heat and light
> Unpaid, untrammeled, with a sweet disdain
> Refusing posts men grovel to attain.

He died at his home on Staten Island, Aug. 31, 1892. He published *Nile Notes of a Howadji* (New York, 1851); *The Howadji in Syria* (1852); *Lotus Eating* (1852); *Potiphar Papers* (1853); *Prue and I* (1856); *Trumps* (1862); *Eulogy on Wendell Phillips* (1865); *Motley's Correspondence* (1890); *From the Easy Chair* (1892). C. K. Adams.

Curtis, Moses Ashley, D. D: botanist; b. in Stockbridge, Mass., May 11, 1808; educated in Williams College, and in 1835 ordained a clergyman in the Protestant Episcopal Church in North Carolina. He early became interested in botany, and later devoted himself to the study of the fungi. His principal publications are the following: *Enumeration of Plants Growing Spontaneously around Wilmington, N. C.* (1834); *Contributions to Mycology of North America* (1848); *New Fungi Collected by the Wilkes Exploring Expedition* (1851); *Catalogue of the Plants of North Carolina* (1860); *Esculent Fungi* (1866); *Indigenous and Naturalized Plants of North Carolina* (1867); *Edible Fungi of North Carolina* (1869). D. in Hillsborough, N. C., 1872.

Charles E. Bessey.

Curtis, Samuel Ryan: U. S. military officer; b. near Champlain, N. Y., Feb. 3, 1805; graduated at West Point in 1831, served in the Mexican war and in the civil war on the Union side; attained the rank of major-general of volunteers and took command of the Army of the Southwest (1862). He was engaged in driving the enemy from Missouri, and fought in the battle of Pea Ridge and numerous actions on his difficult march of over 1,000 miles to Helena, Ark.; U. S. commissioner to negotiate Indian treaties 1865, and to examine the Union Pacific Railway 1865–66, with which he had been closely identified from the beginning. D. at Council Bluffs, Ia., Dec. 26, 1866.

Curtiss, Samuel Ives, Ph. D., D. D.: theologian; b. at Union, Conn., Feb. 5, 1844; graduated at Amherst College 1867, and at Union Theological Seminary 1870. He was a pastor in New York 1870–72, and of the American chapel in Leipzig 1874–78. He became Professor of Old Testament Literature in the Chicago (Congregational) Seminary in 1878. Besides translations from the German, he has published several theological works; among them *The Levitical Priests* (1877). He has also furnished articles to periodicals and to the yearly publication *Current Discussions on Theology* (1883, *seq.*). He is one of the editors of the *Bibliotheca Sacra*. George P. Fisher.

Curtius, koor'tsi-oos, Ernst: archæologist and historian; b. in Lübeck, Germany, Sept. 2, 1814; educated at Bonn, Göttingen, and Berlin; accompanied O. Müller to Greece, where he spent several years. On his return he became the tutor of the Crown Prince Frederick William, afterward Frederick III. In 1856 Curtius succeeded C. F. Hermann at Göttingen, and was called to Berlin in 1865. He superintended the excavations at Olympia from 1875 to 1880. Among his many contributions to Greek history and archæology the most noteworthy are *Peloponnesos* (2 vols., Gotha, 1851); *History of Greece*, 6th ed. 1889 (transl. by A. W. Ward, 5 vols., 1874); *Alterthum und Gegenwart* (3 vols.); *Die Stadtgeschichte von Athen* (Berlin, 1891). D. at Berlin, July 11, 1896. Alfred Gudeman.

Curtius, Georg: classical scholar; brother of Ernst Curtius; b. in Lübeck, Apr. 16, 1820; became Professor of Comparative Philology at Leipzig in 1862. Author of a *Greek Grammar* (1855); *Das Verbum der griechischen Sprache* (2 vols., Leipzig, 1876); *Grundzüge der griechischen Etymologie* (1862; 1879, 5th ed.); *Philologie und Sprachwissenschaft* (Leipzig, 1862). D. at Hermsdorf, Aug. 12, 1885. See Windisch, *Biographisches Jahrbuch IX.* (1886), pp. 75–128.

Alfred Gudeman.

Cur'tius, Marcus, or Mettus: a patriotic Roman youth, who is said to have sacrificed his life for his country about 362 B. C. According to tradition, a chasm opened in the Forum of Rome, which the soothsayers declared could not be filled except by the sacrifice of the chief wealth or strength of the Roman people. Curtius, completely armed, plunged on horseback into the chasm, which immediately closed up.

Curtius, Quintus: See Quintus Curtius.

Curtius, koor'tsi-oos, Theodor: chemist; b. in Dinsburg, 1857. In 1890 he became Professor of Chemistry in Kiel. He prepared hydrazine, and later discovered azoimide or hydrazoic acid, a strong acid of the formula N_3H, resembling hydrochloric acid in many of its properties. I. R.

Cu'rule Chair (Lat. *sella curu'lis*): among the ancient Romans, a throne or chair of state, one of the emblems of ancient kingly power, which was retained by the magistrates of the republic. Its use was limited to the consuls, prætors, curule ædiles, censors, the flamen dialis, and to the dictator or his deputies. In later times the emperors, as well as many inferior officers, sat upon it. Curule chairs were at first or-

namented with ivory, and later sometimes made of ivory and inlaid with gold.

Curule Magistracies: those of the greatest dignity in ancient Rome; so called because the persons who held them enjoyed the privilege of sitting on curule chairs (*sellæ curules*) when engaged in their public duties.

Curupaity: See HUMAÏTA.

Curve [from Lat. *cur'vus*, bent, crooked]: a line which continually changes its direction, or, to speak with more accuracy, a line no part of which is straight. A plane curve is one all parts of which lie in the same plane; one not plane is called a curve of double curvature, or tortuous curve. In a plane curve we recognize at each point (1) the direction of the curve represented by the tangent line at that point; (2) the degree of curvature of the curve, represented by the rate at which the direction is changing as we pass along the curve, and equal to the curvature of a circle having the closest possible contact with the curve at that point. In the case of a tortuous curve we have at each point (1) a certain direction, as in a plane curve; (2) an osculating plane, which means the plane having the closest possible contact with the curve at the point, or, in mathematical language, the plane containing two consecutive tangents, or three consecutive points of the curve; (3) the principal normal to the curve, being that normal which lies in the osculating plane, and therefore the same as the line in which the osculating plane intersects the plane perpendicular to the curve itself. The binormal is the normal perpendicular both to the osculating plane and the tangent to the curve. The curvature is equal to the curvature of the circle which lies in the osculating plane, and has the closest possible contact with the curve. The angle of torsion is the angle between two consecutive osculating planes.

In modern geometry curves are classified according to the degree of the equation by which they are represented. A straight line is represented by an equation of the first degree between the co-ordinates; a curve by one of a higher degree. To represent a tortuous curve two equations between three co-ordinates are necessary. S. NEWCOMB.

Curwen, JOHN: founder of the Tonic Sol-fa system of music; b. at Heckmondwike, Yorkshire, England, Nov. 14, 1816; educated for the Nonconformist ministry; took up the work which filled the rest of his life in 1841; issued his *Grammar of Vocal Music* in 1843; founded the Tonic Sol-fa Association in 1853 and the Tonic Sol-fa College in 1879. In 1864 he gave up his ministerial work, and devoted himself entirely to teaching the system. He edited and published many works on the system. He died June 26, 1880, and the work has since been continued by his son, John Spencer Curwen. D. E. HERVEY.

Curwensville: borough; Clearfield co., Pa. (for location of county, see map of Pennsylvania, ref. 4–D); situated on railway and on Susquehanna river; 6 miles above Clearfield; in a mining region. It has tanneries. foundries, woolen-mills, etc. Pop. (1890) 1,664; (1900) 1,937.

Curzon, GEORGE NATHANIEL: See the Appendix.

Curzon, kür'zōn', **PAUL ALFRED, de**: landscape and figure painter; b. in Moulinat, France, Sept. 7, 1820. Pupil of Drolling and Cabat; second-class medals, Paris Expositions. 1878 and 1889; Legion of Honor 1865. His *Dominicans Decorating their Chapel* and *Ostia* are in the Luxembourg Gallery, Paris. D. in Paris, July 22, 1895.

Cusa-Amari, SALVATORE: Orientalist; b. in Palermo, Italy, Sept. 20, 1822; since 1875 Professor of Arabic in the University of Palermo. Among his publications are a mediæval Moslem description of Rome (1878) and the *Arabic Cosmography of Haytun the Armenian* (1878).

Cusack, MARY FRANCES: See the Appendix.

Cusack-Smith, Sir BERRY: See the Appendix.

Cusanus, NICHOLAUS, whose true name was **Nicolai Chrypffs**, or **Krebs**, and who is also known under the name **Nicholas de Cusa**: theologian; received his surname from Cues, or Cusa, a village on the Moselle, in the diocese of Treves, where he was born in 1401. He was of poor and humble parentage, and early entered the service of Count Ulrich of Manderscheid; but his great natural gifts soon became apparent, and the count sent him to be educated in the school of the Brethren of Common Life at Deventer. Thence he went to the University of Padua, where he studied law and took his degree as Doctor of Laws 1424. As he lost the first case he pleaded, at Mayence, he at once abandoned the legal career and entered the Church, and was ordained a priest 1430. He soon obtained preferment. His knowledge of mathematics and astronomy, of Hebrew and Greek, of philosophy and theology, gave him a great authority. He was made Archdeacon of Liège, and as such he was sent to the Council of Basel in 1432. While there he wrote his *De catholica concordantia*, in which he attacked the secular power of the pope and the donation of Constantine, and his *De authoritate præsidendi in concilio generali*, in which he defended the supreme authority of the œcumenical council and the independence of the secular princes. Nevertheless, a few years later on, as the intimate friend of Eugenius IV., who sent him as papal legate on many important missions, and of Nicholas V., who made him a cardinal in 1448 and Bishop of Brixen in 1450, he maintained and propagated the very opposite views. This singular change has generally been ascribed to ambition and cowardice, but the simplicity, honesty, and ascetic tendency of his private life forbid such an explanation, while his philosophy seems to proffer another. In his *De docta ignorantia* and *De conjecturis*, his two principal philosophical works, he starts from the proposition that absolute truth is completely incongruous with the human mind, that the human mind can only form opinions, conjectures about absolute truth, etc. But this doctrine, which made him a mystic, and not a skeptic, goes far to explain the above change of views; and it must be added that his mysticism was of a rather obscure and confused description. He carried it along with him also into his scientific studies; though he actually anticipated the improvements of the Julian calendar, introduced by Gregory VII., the Copernican view of the earth's position in the solar system, etc., he also wrote *De quadratura circuli*, in which he asserted that that problem was solved, and *De novissimis diebus*, in which he prophesied that the world would be destroyed in 1734. He was the intellectual parent of Giordano Bruno, and the first to break with Scholasticism. The last years of his life were very much troubled. Archduke Sigismund would not recognize him as Bishop of Brixen. The duke imprisoned the bishop (1457), and only released him on very hard conditions. The pope vigorously aided him, and the case was laid before the emperor. Cusanus died at Todi, 24 miles S. of Perugia, Aug. 11, 1464, before an agreement was reached. The decision given after his death was in his favor. The latest edition of his works is that by Henri Petri (Basel, 1565; trans. of the chief by F. A. Scharpff, Freiburg, 1862). See J. M. Dux, *Der deutsche Kardinal N. von Cusa* (2 vols., Regensburg, 1847); F. A. Scharpff, *Der Kardinal und Bischof N. von Cusa als Reformator in Kirche, Reich und Philosophie* (Tübingen, 1871); Richard Falkenberg, *Philosophie des Nicholaus von Cusa* (Breslau, 1880). Revised by S. M. JACKSON.

Cuscus: the popular as well as the generic name for several of the PHALANGERS (*q. v.*). The cuscuses are stoutly built animals of moderate size, covered with thick woolly fur, with an opposable thumb and prehensile tail. They

Cuscus, or spotted phalanger.

range from Celebes to the Solomon islands, and southward to New Guinea and Northern Queensland. They are noteworthy as being the only Old World marsupials found W. of

Guinea, and the gray cuscus, *Cuscus orientalis*, was the first Australian marsupial seen by a European. The spotted cuscus, *Cuscus maculatus*, is about 3 feet in total length, of a yellowish white, marked with dark-brown blotches. It is found in Amboyna, Waigiou, and New Guinea, and is taken for its fur and flesh. It is slow and dull, growls like a cat when provoked, and fights vigorously. F. A. Lucas.

Cush: in the Old Testament, the name (1) of a person, the first son of Ham (Gen. x. 6, 7, 8; 1 Chr. i. 8, 9, 10); (2) of the country near the Gihon (Gen. ii. 13, marg.); (3) of the Nile, the Nile valley southward of Egypt from Syene to the junction of the Blue and the White Nile (Gen. x. 6), inhabited by the Cushites, or Ethiopians, akin to the Egyptians and distinct from the Negroes. In the Egyptian records the people of Cush are always distinguished from the Negroes in both name and appearance, they being always depicted with Caucasian features and of brown color.

Cushing, Caleb, LL. D.: jurist and scholar; b. in Salisbury, Mass., Jan. 17, 1800. He graduated at Harvard College in 1817; was for two years a tutor in that institution; was admitted to the bar, and settled at Newburyport; elected to State Legislature in 1825; visited Europe in 1829, and published *Reminiscences of Spain*. In 1835 he became a Whig member of Congress, in which he served four consecutive terms. As a political friend of President Tyler he separated from the majority of the Whigs in 1841, and joined the Democratic party. He gained distinction as an eloquent debater. In 1843 he was nominated as Secretary of the Treasury, but was rejected by the Senate. He was appointed commissioner to China in the same year, and negotiated the first treaty between the U. S. and that empire. Having equipped a regiment at his own expense, he served as colonel and finally as brigadier-general in the Mexican war in 1847. He was appointed a justice of the Supreme Court of Massachusetts in 1852, and was Attorney-General of the U. S. in the cabinet of Mr. Pierce from Mar., 1853, to Mar., 1857. He was one of the three lawyers appointed by President Grant to advocate the interests and rights of the Americans before the tribunal of arbitrators who met in Geneva in 1871 for the settlement of the "Alabama claims." Appointed minister to Spain in Dec., 1873, and held that office till Jan. 6, 1877. His publications include *The Practical Principles of Political Economy* (1826); *Growth and Territorial Progress of the United States* (1839); and *The Treaty of Washington* (1873). D. at Newburyport, Mass., Jan. 2, 1879.

Cushing, Frank Hamilton: ethnologist; b. at Northeast, Pa., July 22, 1857; spent his boyhood on a farm in Barry, N. Y., and early became interested in collecting Indian relics in Western New York. When sixteen years old young Cushing excavated many ancient camp sites and fortifications in Central New York, and Prof. Baird commissioned him to make collections and surveys for the National Museum. At the age of eighteen he entered Cornell University as special student of natural science, but he continued his studies and explorations, and was given charge of the modern portion of the National Museum collections at the Centennial Exhibition at Philadelphia in 1876. The next year he was made curator of ethnology, National Museum, and became a member of the Anthropological Society at Washington. After two years more of exploration he was appointed to service in the Bureau of Ethnology under Maj. J. W. Powell, and accompanied Col. James Stevenson on his expedition to the pueblos of New Mexico and Arizona. Here he remained for three years, learning the language of the Zuñis and adopting their costume and habits of life. He was adopted into the clan of the Macaw, appointed assistant head chief of the tribal council, and initiated into the principal cult society of *War and Fate*, the *Priesthood of the Bow*. In 1876 he recorded many Zuñi myths, folk-tales, songs, etc., and the next year took charge of the Hemenway exploring expedition among the ruined pueblos of the Southwest. In the summer of 1888 Mr. Cushing conducted excavations in the ruins of the Seven Cities of Cibola, discovered and identified by him seven years previously. He died in Washington, April 10, 1900.

Among Mr. Cushing's contributions to periodical literature and reports to the Bureau of Ethnology are *Zuñi Fetiches*, *Second Annual Report Bureau of Ethnology* (1881); *The Analogy between the Zuñi Sociologic and Mythic Systems* (in *Popular Science Monthly*, 1882); *The Nation of the Willows*, parts i., ii. (*Atlantic Monthly*, 1882); *My Adventures in Zuñi*, parts i., ii., iii. (*Century Magazine*, 1882–83); *A Study of Pueblo Pottery as Illustrative of Zuñi Culture-growth* (1883); *Discovery of the Seven Lost Cities of Cibola, and their Identification as Zuñi Ruins* (1884); *On Post-mortem Distortion of Skulls and its Relation to Burial and Cranial Classification* (*Science*, 1887); *The Villard-Bandelier Expedition*; and *Manual Concepts, or Hand-made Mind* (1892).

Cushing, Luther Stearns: jurist; b. in Lunenburg, Mass., June 22, 1803. He was reporter to the Supreme Court of that State, and published eight volumes of reports. He also published a *Manual of Parliamentary Practice* (1845), well-known as *Cushing's Manual*, and *The Law and Practice of Legislative Assemblies in the United States* (1855), etc. D. in Boston, June 22, 1856.

Cushing, Thomas, LL. D.: statesman; b. in Boston, Mass., Mar. 24, 1725; graduated at Harvard in 1744. His father, Thomas, was a prominent merchant and public-spirited citizen. The younger Cushing was speaker of the Massachusetts House of Representatives 1762–74, and a member in 1774 of the Provincial and the Philadelphia Congresses. He opposed a declaration of independence, but was regarded in Great Britain as the principal leader of sedition. "One object of the Americans," says Dr. Johnson in *Taxation no Tyranny*, "is said to be to adorn the brows of Mr. Cushing with a diadem." He was occupied throughout the Revolution with the affairs of Massachusetts, where he was a judge, and afterward Lieutenant-Governor. D. in Boston, Feb. 28, 1788.

Cushing, William, LL. D.: jurist; b. at Scituate, Mass., Mar. 1, 1732. He became chief justice of the superior court of Massachusetts in 1777, and associate justice of the Supreme Court of the U. S. in 1789; was nominated chief justice by Washington in 1796, but declined; was one of the founders of the American Academy of Arts and Sciences. D. at Scituate, Sept. 13, 1810.

Cushing, William Barker: commander U. S. navy; b. in Delafield, Wis., Nov. 4, 1843; appointed to the Naval Academy in 1857; resigned in 1858. He entered the service as a volunteer officer in 1861; received a commission as lieutenant in the navy July 16, 1862; became a lieutenant-commander in 1864, commander in 1872. In 1861 Cushing distinguished himself on the Blackwater, in the sounds of North Carolina, and at New River Inlet; in 1863 he added to his fame by his expedition up the Cape Fear and Little rivers and his brilliant operations on the Nansemond; and in 1864 by blowing up the ram Albemarle at Plymouth, N. C. At Smithfield, Wilmington, and in leading the men of the Monticello in the assault upon Fort Fisher, he displayed equal bravery and sound judgment. In 1866–67 he served in the Pacific squadron, and in 1868–69 commanded the Maumee of the Asiatic squadron. D. in Washington, D. C., Dec. 17, 1874.

Cushman, Charles H.: commander U. S. navy; b. in Maine, Dec. 6, 1831; entered the navy as a midshipman Mar. 24, 1849. He served in the Pembina at the battle of Port Royal, Nov. 7, 1861, and in the ironclad Montauk at the first attack on Fort Sumter Apr. 7, 1863, and in the many fights of that vessel with the defenses of Charleston harbor during the summer and fall of 1863. He was at both the Fort Fisher fights, and led one of the storming-parties in the assault on the fort of Jan. 15, 1865, where he was severely wounded. D. Nov. 11, 1883.

Cushman, Charlotte Saunders: actress; b. in Boston, Mass., July 23, 1816; a descendant of Robert Cushman (*q. v.*). The bankruptcy of her father, who had been a merchant, obliged her to support herself, and, having a fine contralto voice, she made her *début* as a singer in 1834. She joined an opera troupe; but, during an engagement in New Orleans, lost her voice, and was advised to become an actress. She appeared in 1835 as Lady Macbeth with great success, and removed to New York, where she played until 1840. In 1844 she accompanied Macready through the Northern U. S., and increased her fame as an impersonator of Shakspearean characters. In 1844 she appeared in London, where she was enthusiastically received, acting with her beautiful and gifted sister Susan. She returned to the U. S. in 1849; acted in Great Britain from 1853–57, spending part of every winter in Rome; in 1858, 1860, and 1871–75 acted and gave dramatic readings in the U. S., and retired as an actress at Boston, May 15, 1875. D. in Boston, Feb. 18, 1876. See *Charlotte Cushman, her Letters and Memories of her Life*, edited by Emma Stebbins (Boston, 1878).

Cushman, Robert: one of the founders of the Plymouth Colony; b. in Kent, England, about 1580. He aided the Pilgrims in escaping to Holland, and joined them in Leyden. He assisted Brewster in procuring a patent from King James, and with Carver chartered the Mayflower. He emigrated to Plymouth with his son Thomas in 1621, and preached Dec. 9 of that year the first sermon ever delivered in New England. He returned to England in 1621 to manage the business of the colonists, and died early in 1625.

Cus'ins, Sir William George: composer and teacher; b. in London, Oct. 14, 1833: a chorister in the chapel royal in his tenth year; entered the Brussels Conservatory in 1844; elected King's scholar in the Royal Academy of Music in 1847; appointed organist to the Queen's private chapel in 1849; assistant professor at the R. A. M. in 1857; conductor of the Philharmonic Society in 1867 (which he resigned in 1883), together with other positions of honor. His compositions are important though not numerous; they include *Royal Wedding Serenata* (1863); *Gideon*, oratorio for the Gloucester festival of 1871; a cantata *Te Deum*; two concert overtures; a pianoforte concerto in A minor; and a few smaller works. He was knighted by the Queen in 1892. D. Aug. 31, 1893. D. E. Hervey.

Cusp [from Lat. *cuspis*, point, tip, lance]: in architecture, a projecting point formed by the meeting of two circular arcs or foils tangent to the intrados of an arch. Cusps are especially common in Gothic tracery, window arches, and panels; they are also not infrequent in Moorish architecture.

Cusp, in astronomy, is a point or horn of the moon or of one of the inferior planets.

Cusp, in geometry, a point at which two tangents to a curve coincide. The two branches of the curve may either lie on the same side of the tangent, in which case the cusp is called *ramphoid*, or on opposite sides, when the cusp is *ceratoid*. The cissoid of Diocles furnishes an example of a cuspidate curve with a ceratoid cusp; the cusps of the new moon are ramphoid.

Cusset, küs'sā'; town of France; department of Allier; a mile E. of Vichy (see map of France, ref. 6–G); noted for its healthful and beautiful surroundings. It has manufactures of cotton and wool, vineyards, and mineral springs. Pop. (1896) 6,441.

Cust, Robert Needham: See the Appendix.

Custard Apple: See Anona.

Custer, Elizabeth Bacon: author; widow of Gen. George Armstrong Custer (*q. v.*), to whom she was married in 1864. Mrs. Custer shared her husband's campaigns against the Indians, and since his death has published *Boots and Saddles* (1885); *Tenting on the Plains* (1887); and *Following the Guidon* (1891). H. A. B.

Custer, George Armstrong: U. S. military officer; b. in New Rumley, O., Dec. 5, 1839; graduated at West Point in 1861; served in the civil war in the Manassas campaign 1861, engaged at Bull Run; in the Virginia Peninsula 1862, engaged at Yorktown, and aide-de-camp to Maj.-Gen. McClellan in the subsequent operations of the campaign; in the Maryland campaign 1862, engaged at South Mountain and Antietam; in the Rappahannock campaign 1863, engaged on "Stoneman's raid" and at Brandy Station; in Pennsylvania campaign 1863, engaged at Gettysburg (brevet major) and various minor actions; brigadier-general of volunteers in 1863; in operations in Central Virginia 1863–64, engaged in numerous skirmishes, etc.; in the Richmond campaign 1864, engaged at Wilderness, Todd's Tavern, Yellow Tavern (brevet lieutenant-colonel), Meadow Bridge, Haw's Shop, Cold Harbor, Trevillian Station, etc.; in the Shenandoah campaign 1864–65, engaged at Opequan (brevet colonel), Cedar Creek; brevet major-general for gallantry at Winchester or Cedar Creek and numerous smaller engagements; in command of the cavalry division in the pursuit of Lee's army 1865, engaged at Dinwiddie Court-house, Five Forks (brevet brigadier-general), Sailor's Creek, and Appomattox (brevet major-general); in command of the cavalry division in the military division of the Southwest and Gulf 1865; as chief of cavalry in the department of Texas 1865–66; major-general U. S. volunteers after Gen. Lee's surrender. After the war he was on Western frontier duty, where he was killed in battle, by the Indians, June 25, 1876.

Custine, küs'teen', Adam Philippe, Count de: French general; b. at Metz, Feb. 4, 1740; served as colonel at Yorktown, Va., in 1781; commanded brilliantly an army on the Rhine in 1792. His popularity and talents excited the jealousy of the Jacobins, and he was guillotined Aug. 28, 1793. See his memoirs by D'Hilliers, 1795.

Custine, Astolph Louis Leonard, Marquis de: grandson of Adam Philippe; b. at Niderwiller, Mar. 18, 1790; traveled through England, Scotland, Switzerland, Italy, Spain (1835), and Russia, and died Sept. 9, 1857. His work *La Russie en 1839* (4 vols., 1843) created at the time of its publication a profound sensation, and the Russian Government deemed it necessary to have an answer to it published.

Cus'tis, George Washington Parke: an adopted son of Gen. Washington; b. at Mount Airy, Md., Apr. 30, 1781. He was a grandson of Mrs. Martha Washington. He produced several plays and orations, and wrote a volume of *Recollections of Washington*, which was published in 1860. D. at Arlington House, Fairfax co., Va., Oct. 10, 1857.

Custody: in law, the care or possession of goods without any special or adverse property therein, as in the case of a servant who is charged with the keeping and care of property subject to the owner's direction. F. Sturges Allen.

Customs, or **Customs Duties**: originally applied to almost any tax or toll other than the general property tax; now practically confined to taxes on imports of foreign merchandise. See Finance, Tariffs, and Taxation.

Cus'tos rotulo'rum [Lat., keeper of the rolls]: in Great Britain, the first justice of the peace in a county, who is also the chief civil officer of the county, and nominally is the keeper of the rolls (writs, indictments, etc.). In practice, however, these are kept by the clerk of the peace, who is appointed by the custos rotulorum.

Revised by F. Sturges Allen.

Custozza, koos-tōd'zaă: Italian village near Verona (see map of Italy, ref. 3–D); scene of two victories by Austrians over Italians; on July 25, 1848, by Radetzky over King Charles Albert; and on June 24, 1866, by Archduke Albert over La Marmora.

Cüstrin: same as Cuestrin (*q. v.*).

Cutch, or **Katch**: a feudatory state of British Bombay, India; lying between the delta of the Indus, the Gulf of Cutch, and the *Runn* or *Ran* of Cutch, the latter an area of 7,000 sq. miles of arid land encrusted with salt. The natives are hardy sailors. The exports are cotton, glue, and oil. The political system is like feudalism, with a sovereign called a *rao* over about 200 chieftains. The best-known town is Bhuj. Area, 6,500 sq. miles. Pop. 512,000.

Revised by M. W. H.

Cutch: See Catechu.

Cutch Gunda'va: the most important province of Baluchistan; between lat. 27° and 29° 50′ N., and lon. 67° 20′ and 69° 15′ E. Area about 10,000 sq. miles. Surrounded by deserts, it is exceedingly fertile, exporting grain, cotton, and indigo. It is the most populous and valuable portion of the possessions of the Khan of Khelat.

Cuthæans, or **Cuthites**: the inhabitants of Samaria; so called in the Talmud and the Chaldee, because Shalmaneser colonized that part of Palestine with people from Cuthah, a district of Asia, and these colonists formed with the few remaining natives a mixed race.

Cuthbert: town and railway junction; capital of Randolph co., Ga. (for location of county, see map of Georgia, ref. 6–F); 118 miles S. W. of Macon. It has a college for boys and a college for girls, six churches, public schools, agricultural and horticultural industries. Pop. (1880) 2,129; (1890) 2,328; (1900) 2,641. Editor of "Liberal Enterprise."

Cuthbert (illustrious for skill), or **Guthbert** (worthy of God): early English saint; b. near Melrose-on-the-Tweed; entered the abbey there in 651, and in 664 became its prior, and shortly afterward prior of Lindisfarne. He retired in 676, and till 685 he led a solitary life on Farne or House island. On Mar. 26, 685, he was consecrated Bishop of Lindisfarne, but in 687 gave up his bishopric and retired to his cell on Farne island, where he died Mar. 20, 687. He had the credit of working miracles. His life was written by Bede.—Cuthbert, Abbot of Jarrow, wrote a moving description of the death of the Venerable Bede 735. (See Twysden, *Decem Scriptores*, 1652).—Cutibert, twelfth Archbishop of Canterbury (741–758), was a friend of Boniface, and sympathized with Pope Zacharias in his efforts to build up the papacy. His letter to St. Boniface describing ecclesiastical abuses is in Hussey's *Bede's Historia Ecclesiastica*. D. in Canterbury, Oct. 26, 758.

Cuthbert Bede: See Bradley, Edward.

Cutler, Elbridge Jefferson: scholar and poet; b. in Holliston, Mass., Dec. 28, 1831. From 1865 till his death, Dec. 27, 1870, he was Professor of Modern Languages at Harvard. He wrote *War Poems* (1867) and *Stella* (1868).

Cutler, John: See the Appendix.

Cutler, Manasseh, LL. D.: Congregational minister: b. in Killingly, Conn., May 3, 1742; graduated at Yale in 1765; was settled over a church in Ipswich, Mass.; served as a chaplain in the army in the Revolutionary war; studied law and was admitted to the bar before he became a minister. He was an accomplished botanist and proficient in other branches of science. He described 350 species of plants indigenous in New England. He was a leader of a party that settled Marietta, O., in 1788, and his services in connection with the settlement and political relations of that whole region were invaluable. He returned to his church in Massachusetts; declined a commission as judge of the Supreme Court of Ohio territory. He was a member of Congress (1801–05). D. at Hamilton, Mass., July 28, 1823. See the *Life of Manasseh Cutler* (2 vols., Cincinnati, 1888).

Revised by George P. Fisher.

Cutler, Timothy, D. D. Oxon.: educator and clergyman; b. in Charlestown, Mass., in 1685. He became president of Yale College in 1719; resigned in 1722; became a convert to episcopacy and in 1723 was ordained in England a member of the Church of England and became rector of a church in Boston. D. in Boston, Aug. 17, 1765.

Cutlery [deriv. of Eng. *cutler*, a maker of knives, from Anglo-Fr. *cotillere* < O. Fr. *cotelier*]: sharp and cutting instruments made of iron or steel. The most primitive cutting instruments were flints, shells, etc., which were succeeded by bronze implements and weapons, and these in turn by iron. In recent years the use of wrought iron for cutlery has been almost entirely superseded by steel, all kinds of steel, such as Bessemer, open-hearth, and crucible, being used for different classes of instruments. For the very finest instruments only the best quality of crucible steel is generally used. Formerly only the cutlery made in Sheffield, England, was considered to be of the highest grade—that is, for the 100 years following Benjamin Huntsman's invention of cast steel, in 1770—but now cutlery of excellent quality is made in many countries in Europe as well as in the U. S. Many centuries ago swords and knives were made in Damascus, and also, during the Middle Ages, in Spain and Italy, of qualities which are equal to the best produced in the present day. Cutlery is made almost exclusively by a forging process, hand-forging for knives and other small pieces, and forging under a power-driven helve-hammer for large pieces. The drop forging-press (introduced about 1860) is now superseding hand-forging. In the production of a fine quality of cutlery two things are most essential: first, the selection of steel of the quality proper for the particular instrument to be made; and second, great skill on the part of the workman in forging at the right heat and in tempering. In modern practice the element of personal skill is rendered less important by the adoption of heating furnaces, whose temperature is carefully regulated by pyrometers, and in tempering and annealing baths and furnaces, whose temperature is also closely regulated. The old method of drawing the temper, in which the extent of drawing is regulated by the workman's judgment of the color formed by a coating of oxide on the brightened surface of the hardened steel, is being superseded by the method of placing the articles in an oven of regulated temperature for a definite period of time. Axes and other cutting instruments which have a heavy thick portion and a cutting edge are commonly made of two kinds of steel, the former of a soft steel of cheap quality, and the latter of the finest crucible steel.

Cuttack, or **Cattack**: city; capital of a district of the same name; on the Mahanadi river; 250 miles S. W. of Calcutta (see map of N. India, ref. 9–H). It has a temple and mosques, chapels, and manufactures of shoes, brass, and salt. Pop. 43,000; of district, 1,800,000; area of district, 3,517 sq. miles.

Cutter: a small vessel with one mast and a bowsprit, built with especial reference to speed. The distinction between a cutter and a sloop is that in a cutter the jib has no stay to support it. The term "revenue cutters" is applied to those which are employed in the pursuit of smugglers. The cutters belonging to ships of war are clincher-built boats about 25 feet long.

Cutter, George Washington: See the Appendix.

Cut-throat Trout: the *Salmo mykiss*; so called from a dash of scarlet or crimson always present between the branches of the lower jaw. The most widely distributed of the American trout, highly variable in its appearance, its range extending from Kamtchatka through all the rivers of Alaska, British Columbia, Washington, Oregon, Montana, and southward in the mountain streams as far as Chihuahua, but only including the northeastern portion of California. This fine trout sometimes reaches a weight of 30 lb. It is spotted with black, and it is best known by its small scales, there being 160 to 180 in a lengthwise series along its sides.

David S. Jordan.

Cutting, Hiram Adolphus: See the Appendix.

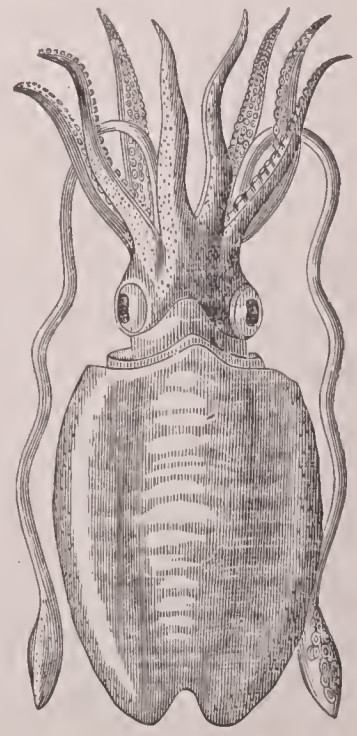
Cutting, James Ambrose: See the Appendix.

Cutting, Sewall Sylvester, D. D.: clergyman; b. at Windsor, Vt., Jan. 19, 1813; graduated at the University of Vermont in 1835; Baptist pastor in West Boylston, Mass., 1836, and in Southbridge, Mass., 1837–45; editor of the *New York Recorder* 1845–50 and 1853–55; editor of the *Christian Review* 1849–52; of the *Watchman and Reflector* in Boston 1851–53; in 1855 founded with Rev. Dr. Edward Bright *The Examiner* in New York; Professor of Rhetoric and History in the University of Rochester 1855–68; secretary of the American Baptist Educational Commission 1868–76; of the American Baptist Home Missionary Society 1876–79. He was author of *Historical Vindications of the Baptists* (1858); *Struggles and Triumphs of Religious Liberty* (1876). D. in Brooklyn, N. Y., Feb. 7, 1882.

Cuttings: in horticulture, living asexual portions of plants which are detached and inserted in soil or water that they may root and form new plants. Cuttings are usually made of stems, although they are sometimes made of leaves, as in certain begonias and in gloxinias; sometimes of roots, as in blackberries and many ornamental plants, and they are sometimes taken from tubers, as in the potato. Stem-cuttings are of two general kinds, soft-wood and hard-wood. Soft-wood cuttings are employed in most common greenhouse plants, as geraniums, coleus, carnations, and the like. These are pieces of the firm growing wood, comprising one or two joints, and inserted in the soil usually not deeper than a fourth or half inch. Hard-wood cuttings are made from mature and dormant wood, as in currants and grapes, and they are most commonly planted out of doors. The best conditions for cuttings are a uniformly moist but not wet soil, which is porous and well drained, comparatively uniform temperature, and a greater or less degree of bottom heat. Full directions for propagation by means of cuttings may be found in *Propagation of Plants*, by A. S. Fuller, and *The Nursery-book*, by L. H. Bailey.

L. H. Bailey.

Cuttlefish: any one of many dibranchiate cephalopodous mollusks, especially one of those of the family *Sepiidæ*, the species of which are numerous and almost world-wide in distribution. The term popularly includes nearly all the dibranchiate cephalopods. They are characterized by the presence of an ink-bag filled with black or brown "sepia," a substance which the animal ejects when pursued, so as to conceal itself from view by coloring the waters around it. This substance was formerly much employed in making sepia or india ink (now made of lampblack, etc.). This coloring-matter is so permanent that it has occasionally been prepared from fossil specimens. "Cuttlebone" (sometimes called *calamary*) is in reality the calcareous internal shell of these animals, especially that of the *Sepia officinalis* of Europe. When powdered it is sold under the name of "pounce," and is used for polishing, for tooth-powder, and in making molds for delicate castings. It was formerly much used in medicine, but is valuable only for its feebly antacid properties. In the tropical seas cuttlefish have been found weighing 2 tons. They are all



Cuttlefish: *Sepia officinalis.*

marine. Many fossil species occur. Several species are found on the Atlantic coast of the U. S. See SQUID.

Cutty-stool [Scottish, *cutty* or *kittie*, a woman of light or worthless character], or **Creepie Chair**: formerly a seat in Scottish churches where offenders against chastity were obliged to sit for three Sundays, and receive a reprimand from the minister.

Cutworms: larvæ, mostly belonging to lepidopterous insects of the family *Noctuælitæ*, and especially to those of the genus *Agrotis*. They cut off Indian corn, cabbage, and other plants just below the surface of the ground; and one species at least (*Agrotis cochrani*) climbs apple and pear trees and destroys the young buds. No effective remedy for their ravages is known.

Cuvier, Fr. pron. kü'vi-ā', GEORGE CHRÉTIEN LÉOPOLD FRÉDÉRIC DAGOBERT, Baron: naturalist; b. at Montbéliard, then in Würtemberg, whither the family had removed from Jura in the sixteenth century upon embracing Protestantism, Aug. 23, 1769. His father was an officer in a French regiment of Swiss mercenaries. He studied political science at the Carolinian academy in Stuttgart, through the interest of the duke. He was an enthusiastic student from boyhood, and his passion for natural history showed itself in his thirteenth year. He became in 1788 tutor to the son of Count d'Héricy, who lived in Normandy, and remained in this situation nearly six years, at the same time pursuing his studies. Early in 1795 he removed to Paris, where he associated with Jussieu and Geoffroy Saint-Hilaire. He became in July, 1795, Professor of Comparative Anatomy in the Museum of Natural History, and began to form his great cabinet of comparative anatomy. In 1796 he was admitted into the Institute, then just founded. He displayed his genius for classification in a work called *Tableau Élémentaire des Animaux* (1798), and succeeded Daubenton as Professor of Natural History in the College of France in 1800. In 1801 he commenced the publication of the important *Leçons d'anatomie comparée* (5 vols., 1801–05; new ed. 1840). He married Madame Duvaucel, the widow of a farmer-general, and was chosen perpetual secretary of the Academy of Sciences in 1802. In 1808 he was appointed councilor to the Imperial University. He displayed a rare faculty of expressing scientific truths in popular and elegant language in his *Discourse on the Revolutions of the Surface of the Globe*, in which he propounds the theory of the correlation of forms in organized beings. He was appointed master of requests by Napoleon in 1813, and councilor of state in 1814. He published in 1817 his celebrated *Animal Kingdom* (*Règne Animal distribué d'après son Organisation*, in four volumes; new edition by his pupils, 11 vols., with 993 plates, 1836–49), in which he proposed the arrangement of animals in four divisions—the Vertebrata, Mollusca, Articulata, and Radiata. Soon after the restoration of the Bourbons he was appointed chancellor of the University of Paris by Louis XVIII. He was elected a member of the French Academy in 1818, and received the title of baron in 1820. He wrote many able notices of scientific men for the *Biographie Universelle*. Among his other works is an excellent *Natural History of Fishes* (1818–30, with the continuation by Valenciennes, 22 vols.), of which eight volumes were finished during his life. As a professor he was distinguished for facility of elocution, clearness of ideas, and the art of fixing the attention in philosophical or historical digressions. He first applied to zöology the natural method, and founded a system on the basis of the invariable characters of anatomical structure. He is regarded as the founder of the science of comparative anatomy, and his knowledge of that science was such that a bone or small fragment of a fossil animal enabled him to determine the order, and even genus, to which it belonged. During the last twelve years of his life he rendered important services as president of the committee of the interior. He was created a peer of France in 1831. D. in Paris, May 13, 1832. He had several children, but none of them survived him. His disposition was amiable, and his moral character unimpeachable. See A. de Candolle, *Notice sur la Vie et les Ouvrages de G. Cuvier*; R. Lee, *Memoir of Baron Cuvier* (1833); L. de Loménie, *G. Cuvier, par un homme de rien* (1841); Flourens, *Cuvier, Histoire de ses Travaux* (1845).—The brother of the naturalist, FRÉDÉRIC CUVIER, b. June 28, 1773, published, with Geoffroy Saint-Hilaire, *Histoire naturelle des mammifères*.

Cuvillier-Fleury, kü'vēe'yā'flö'ree', ALFRED AUGUSTE: author; b. in Paris, Mar. 18, 1802; was educated in Collège Louis-le-Grand, and became in 1819 private secretary to Louis Bonaparte, ex-King of Holland. In 1827 Louis Philippe chose him as tutor for the Duke of Aumale, and in 1834 he entered the staff of the *Journal des Débats*. Of his articles there exist various collections: *Portraits Politiques et révolutionnaires* (1851–52); *Études historiques et littéraires* (1854); *Nouvelles Études* (1855); *Voyages et Voyageurs* (1854); *Dernières études historiques et littéraires* (1859); *Historiens, Poètes et Romanciers* (2 vols., 1863); *Études et Portraits* (1865–68). D. in Paris, Oct. 18, 1887.

Cuxha'ven: seaport-town and watering-place of Germany; on the left bank of the Elbe, at its entrance into the German Ocean, 72 miles by rail W. N. W. of Hamburg, and about 50 from Bremen (see map of German Empire, ref. 2–D). It has long been the port whence Hamburg steamers depart when the Elbe is frozen; recently, however, nearly $2,000,000 have been spent in improving the harbor, which has an area of 60,000 sq. meters, and a depth at low tide of 26½ feet, and is to be used by the largest steamers all the year round. Pop. (1895) 5,300.

Cuyabá, kwĕe-ăa-baa': city of Brazil: capital of the state of Matto Grosso; on the Cuyaba river, an affluent of the São Lourenço and Paraguay (see map of South America, ref. 5–E). It is an episcopal town, and has a large military arsenal and barracks. Cuyabá originated as a mining town in 1718, and for a time the gold-washings were enormously productive; at present they are nearly abandoned, and the exports are unimportant, the surrounding region being very thinly settled. The climate is hot but generally healthful. Pop. (1893) about 20,000. H. H. S.

Cuyahoga, kī-a-hō'ga, **Falls**: town in Summit co., O. (for location of county, see map of Ohio, ref. 2–H); on C. A. and C. and E. and W. R. Rs. (Baltimore and Ohio system), and on Cuyahoga river; 5 miles N. of Akron and 34 miles S. S. E. of Cleveland. The village has 5 churches, 2 schools, manufactures of clay-working machinery, rivets, electrical machinery, bolts, paper, sewer-pipe, tile, turbine water-wheels, wire-machines, tinware, paper bags, flour, etc.; it has abundant water-power, and medicinal waters. Pop. (1880) 2,294; (1890) 2,614; (1900) 3,186.
EDITOR OF "REPORTER AND WESTERN RESERVE FARMER."

Cuyler, THEODORE LEDYARD, D. D.: clergyman; b. at Aurora, N. Y., Jan. 10, 1822; graduated at Princeton College in 1841; at Princeton Seminary in 1846; preached three years at Burlington, N. J.; was first pastor of the Third Presbyterian church at Trenton, N. J.; then pastor of the Market Street Reformed church in New York city; and became pastor of Lafayette Avenue Presbyterian church, Brooklyn, N. Y. The twenty-fifth anniversary of his pastorate was celebrated Apr. 5, 1885. He had then preached there 2,300 sermons, delivered over 1,000 addresses, and received into membership in the church 3,610 persons, 1,566 of them by conversion. He resigned in 1890. He is the author of several works, such as *Cedar Christian* (1863); *The Empty Crib* (1868); *Heart-life* (1871); *From the Nile to Norway* (1881); and *Stirring the Eagle's Nest* (1890). Has also published over 2,700 letters and articles in newspapers and magazines, many of which have been reprinted in Europe.

Cuyo: a portion of Chili which in colonial times extended E. of the Andes. The Spanish Government had fixed the limits of the captain-generalcy of Chili at 100 leagues from the Pacific coast, and not long after the conquest some of the colonists crossed the Andes and founded several towns on the other side. One of these, Cuyo, gave a general name to the region, which eventually extended to about lon. 63° W. and embraced Tucuman, Mendoza, and other flourishing places. The limits with the Platine provinces were never definitely fixed, and the Araucanian wars, barring the best passes of the Andes, made it difficult to maintain communications with the capital of Chili. In 1776 Cuyo was transferred to the new viceroyalty of Buenos Ayres, and the Andes were fixed as the western boundary of Chili. HERBERT H. SMITH.

Cuyp, koip, ALBERT: Dutch painter; b. at Dort, Holland, in 1605; pupil of his father, Jacob Gerritse. Cuyp was one of the most successful painters of effects of sunlight whose works we possess; a tonalist rather than a colorist, and with a happy perception of the picturesque, and as a painter of the golden sunset phenomena he has had many imitators, but few who approached him. He left a large number of pictures. Much of his work is in England: five pictures in the National Gallery, seven or eight in the Bridgewater Gal-

lery, and many in other private collections. Pictures of his are also in the Dresden Gallery, the Amsterdam Gallery, and in many others. D. at Dort in 1691. W. J. Stillman.

Cuyp, Jacob Gerritse: portrait and animal painter; b. at Dort, Holland, in 1575; pupil of Bloemart; with others, founded at Dort in 1642 a guild of St. Luke. D. after 1649.

Cuzco: a southeastern department of Peru; bounded N. by Loreto, E. by Bolivia, S. by Puno and Arequipa, and W. by Apurimac, Ayacucho, and Junin. Area, 27,285 sq. miles. Capital, Cuzco. The southern and more populous portion is an elevated and much-broken region between the lofty chains of the Andes and the central Cordillera; the rivers rising here break through the Andes northward, in deep cañons, uniting beyond to form the Ucayali, the true source of the Amazon. Beyond the Andes the northern and western portions of the department lie in the warm, damp plains of the Amazonian depression, and they are covered with forests which extend far up the mountain sides. The Cuzco basin, by its fertility and delightful climate, is one of the most favored parts of Peru, but owing to the lack of communications its development has been slow. The Mollendo R. R., now in course of construction, will connect it with Lake Titicaca and the Pacific. The mountain regions of Cuzco are rich in minerals. Pop. (1876) 238,445; (1893) probably not much greater. Herbert H. Smith.

Cuzco (Quichua, navel): an interior city of Peru; capital of the department of the same name; on an irregular tableland or terrace, 11,380 feet above the sea. To the N. W. the hill of Sacsahuaman rises high above, and two streams flow down through the city in ancient walled channels—the work of the Incas (see map of South America, ref. 5–B). Cuzco is the most ancient city of Peru, and perhaps of America. It was the birthplace of the Inca power, capital of their empire, which eventually spread over a great part of the Andean region. According to tradition it was founded by Manco Capac in the twelfth or thirteenth century. It is certain, however, that some of the monuments are preincarial, and there can be little doubt that an Indian settlement existed here long before the time of Manco Capac. At the time of the conquest the city proper probably had 50,000 inhabitants, with as many more in the immediate vicinity. The streets were narrow, crossing each other at right angles, and paved with pebbles; near the center there was a large square, and from this radiated four streets to the four great Inca roads. The houses, at least of the better class, were built of stone, and covered with elaborate and handsome thatched roofs. But the glory of Cuzco was the *Ccuri-cancha*, or great temple, commonly called the Temple of the Sun. It was 296 feet long by 52 broad, and was originally built for a palace of the Incas. The interior of the main hall was lined in great part with thin gold. An elliptical gold plate at one end represented the Supreme Deity, and this was flanked by figures of the sun and moon. Its site is occupied by the Cathedral of Cuzco, but portions of the original walls are visible. The *Acclahuasi*, or great house of the virgins of the sun, has been replaced by a convent, but parts of this also can be traced, and portions of old houses and palaces about the city remain almost entire. "The world," says Mr. Squier, "has nothing to show in the way of stone-cutting and fitting to surpass the skill and accuracy displayed in the Inca structures at Cuzco." On the Sacsahuaman hill behind the city is the great fortress of Cuzco, which probably was built before the time of the Incas. It is a fortification 600 feet long, and consisting of three walls, one above the other on successive terraces. They are built of immense stone blocks, some of them 27 feet long by 15 high; and, what is very remarkable, the work is constructed with salient and retiring angles, involving the true principle of modern fortification. Pizarro entered Cuzco Nov. 15, 1533; the city was speedily rifled of its gold, and in 1534 was given a Spanish government. It was besieged in 1536 by the Inca Manco, who set fire to the thatch roofs, burning most of them. For many years after the conquest, and long after Lima was founded, Cuzco remained the chief city, though no longer the capital of Peru, and it is said to have had in the seventeenth century about 50,000 inhabitants. The population in 1893 was about 20,000. About seven-eighths are Indians, and Quichua is the common language. The climate is cool, but seldom cold, and very salubrious. The Yucay and other valleys a few leagues distant yield tropical fruits. With the completion of the Mollendo R. R. to this point, Cuzco will doubtless renew its ancient prosperity, while losing the air of antiquity which is now its great charm. See Markham's *Cuzco and Lima*, and *History of Peru*; Squier's *Peru*; Prescott's *Conquest of Peru*; also Incan Antiquities.

Herbert H. Smith.

Cuzco: See Indians of Central America.

Cyane, sī′ā-nēē (in Gr. Κυανή): a water-nymph of classic mythology, who tried to rescue her playmate Proserpine, and was changed by Pluto into a fountain in Sicily. She is also called the wife of Æolus, god of the winds. The fountain Cyane, near Syracuse, still flows, and gives rise to a considerable river.

Cya′nea [from Gr. κύανος, dark-blue substance]: a genus of jellyfishes belonging to the discomedusan *Scyphozoa*. They have a large jelly-like disk, from the center of which hangs down the proboscis terminating in four greatly fringed lobes. From the margin of the disk numerous long tentacles are developed. The only species in North America, *Cyanea arctica*, reaches an enormous size, the disk being sometimes 7 feet in diameter, the tentacles 200 feet long. The European species is said to sting severely, but *Cyanea arctica* does not affect man except in places, as between the fingers, where the skin is thin. J. S. Kingsley.

Cy′anide [from Gr. κύανος, dark-blue substance]: a salt of hydrocyanic or prussic acid which has the composition HCN, containing the elements hydrogen, carbon, and nitrogen. The cyanide which is manufactured in largest quantity is commonly called *yellow prussiate of potash*, or *potassium ferrocyanide*. (See Potassium.) From this, other cyanides, such as potassium cyanide, KCN, Prussian blue, etc., are prepared. Most cyanides are very poisonous. Some of them are of great importance in the arts, as in gilding, electroplating, photographing. Some are used in medicine.

Ira Remsen.

Cy′anite, or **Kyanite** [Gr. κύανος, a dark-blue substance, dark blue + suffix *-ite* (used of minerals)]: a beautiful mineral (sometimes called *Disthene*), a form of silicate of alumina. It often occurs crystallized, and generally in broad prisms. It is transparent or translucent, sometimes opalescent, and exhibits various shades of blue. Its formula is $Al_2O_3SiO_2$.

Cyanogen [from Gr. κύανος, a dark-blue substance + root *gen-*, produce, in γεννάω, beget, etc.; so named with reference to Prussian blue, one of its compounds]: a gas formed by heating mercuric cyanide. It is colorless, has the odor of peach kernels, and is extremely poisonous. It consists of the elements carbon and hydrogen, and has the chemical formula C_2N_2. All the cyanides are related to cyanogen, as the chlorides are related to chlorine and the iodides to iodine. The group CN enters into chemical compounds as the element, Cl, does, and is said to play the part of an element. Such a group is called a radical. Ira Remsen.

Cyanom′eter [from Gr. κύανος, a dark-blue substance + μέτρον, measure]: an instrument for measuring the blueness of the sky. It consists, essentially, of a disk divided into sectors, the several sectors being colored with tints of blue gradually increasing in intensity. Held between the eye and the sky, some sectors will appear deeper, and some lighter in tint than the heavens. That one where the difference is insensible is the measure of the blueness for the time being.

Cyano′sis [from Gr. κύανος, a dark-blue substance, dark blue + ending *-ωσις*, common to Gr. words denoting a condition of coming to be, or coming to have, as λίθωσις, petrifying (λίθος), ἴσωσις, a making equal (ἴσος), ἰδίωσις, appropriation (ἴδιος), δικαίωσις, justification (δίκαιος), etc., and so used of names of diseases]: a condition of lividity of the skin due to failure of the circulation or respiration. *Congenital cyanosis*, or *cyanopathy*, is an affection in which the skin of the newly born infant shows this appearance. The popular term "blue-baby" is sometimes applied to the child suffering this disease. It is the result of various congenital malformations and conditions of imperfect development. Frequently the pulmonary circulation is defective. In some cases the foramen ovale, a communication between the left and right sides of the heart, remains open as in the fœtal state. The venous and arterial blood are mingled, as is normal before birth. Cyanosis may prove fatal in a few days after birth, but in other cases, with care, life may be prolonged for some years. Growth and normal development in other respects are rarely attained.

Revised by William Pepper.

Cya'thea [from the Gr. *κύαθος*, a cup, alluding to the shape of its indusia]: a genus of beautiful tree-ferns of the family *Polypodiaceæ*, found in the tropical regions of the Old and New World. The species are numerous. *Cyathea arborea*, a native of the West Indies, Mexico, and South America, has bipinnate leaves. *Cyathea medullaris*, a New Zealand species, has edible starchy roots.

Cyathophyl'lum [from Gr. *κύαθος*, cup + *φύλλον*, leaf]: the typical genus of a prominent family of Palæozoic corals (*Cyathophyllidæ*). The Greek name, as well as the English name *cup-corals*, is applied to corals of this genus on account of the cup-shaped corallum of the single polyparies. The cup-corals are either simple or compound, and their septæ are arranged in groups or multiples of four, and they are particularly abundant in the limestones of the Devonian system, although the genus *Cyathophyllum* ranges from the Silurian to the Carboniferous. H. S. Williams.

Cyax'ares (in Gr. Κυαξάρης; Old Persian, *Uvakshatara*, i. e. beautiful-eyed) **I.**: a king of the Medes; began to reign in 633 B. C. He waged war against the Scythians, who invaded his dominions, and against Alyattes, King of Lydia. A total eclipse of the sun which occurred about 610 B. C. induced Cyaxares and Alyattes to make peace. Cyaxares and the King of Babylon took Nineveh in 625. He died in 593 B. C., and was succeeded by his son Astyages, who reigned from 593 to 569 B. C.

Cyaxares II.: a son of Astyages, grandson of Cyaxares I., and uncle of Cyrus the Great. Though not mentioned by Herodotus or Ctesias, he is named by Xenophon as the successor of Astyages in the Median kingdom, and is probably the same as "Darius the Median" spoken of by the prophet Daniel (v. 31). He is supposed to have reigned in Babylon for two years after its conquest by Cyrus in 538 B. C. He came to the throne of Media in 569 B. C.

Cyb'ele (in Gr. Κυβέλη, or Κυβήλη), called also **Cybe'be** (in Gr. Κυβήβη) and **Rhe'a** (in Gr. Ῥεία, Ῥέα, or Ῥείη): a goddess of classic mythology; called in Phrygia and elsewhere in Western Asia "Mother of the Gods" or "Great Mother." She was supposed to be a daughter of Uranus and Terra, the wife of Saturn (Cronos), and the mother of Jupiter. In Phrygia her priests were called Corybantes (*q. v.*). She was sometimes styled the "Berecynthian mother," from the hill Berecynthus, where she had a temple. She is generally represented riding in a chariot drawn by lions, with a diadem of towers upon her head.

Cy'cads [of uncertain origin]: a small family of trees and shrubs (*Cycadeæ*), related to the conifers, with which they agree in being gymnospermous. They have mostly simple stems, with a large pith and large pinnately compound, evergreen leaves, which are clustered toward the summit of the stem. They are of slow growth and are long-lived; the stem elongates by a slowly unfolding terminal bud, much as in the palms, which they resemble so remarkably that they are popularly called "sago palms." The ovules are produced on the margins of slightly modified leaves (in *Cycas*), or on the scales of cones (in other genera). The pollen-bearing flowers constitute cones, roughly resembling the cones of the conifers. Cycads were very numerous in ancient geological periods, but they are now few in number (about eighty species), and are restricted to the warm parts of the world. The living species are disposed in two families as follows: 1. *Cycadaceæ*, including but one genus —*Cycas*—represented by sixteen species, of which *C. revoluta* of China and Japan is common in conservatories. Its pith contains much starch, which is the "sago" of commerce. 2. *Zamiaceæ*, including eight genera, of which *Zamia* (thirty species), *Dioon*, and *Encephalartos* are best known. Two species of *Zamia* are natives of the Southern U. S.

Charles E. Bessey.

Cy'chla, or **Cichla**, sik'lā: a genus of perch-like, fresh-water fishes of the family *Chromidæ*, sometimes placed in a separate family, *Cichlidæ*. There are three or four bright-colored species, found in Brazil, Guiana, and Peru, and used for food.

Cyclades, sik'la-dēēz: a group of islands in the Ægean, numbering twelve in all, according to Strabo, so called because they surrounded the sacred island of Delos (see map of Greece, ref. 17-L). These islands are Syra, Delos, Andros, Tenos, Mykonos, Naxos, Paros, Antiparos, Siphnos, Seriphos, Kythnos, and Keos. The nomarchy of the Cyclades in the modern kingdom of Greece includes, in addition to the above, the following eight islands: Melos, Thera, Kimolos, Pholegandros, Sieynos, Ios, Amorgos, and Anaphe. The surface is mountainous, the soil productive. Pop. of the nomarchy (1896) 134,747. Area, 926 sq. miles. Syra or Hermopolis is the most important city.

Cyclamen, sik'la-men [from Gr. *κυκλάμινος*, *κῦκλαμίς*, a plant-name]: a name given to plants of a genus of the Primrose family. There are two chief species in cultivation, *Cyclamen europæum* and *C. latifolium* (*C. persicum* of florists). The former is the fragrant and the hardier species, and is native to the south of Europe. The latter comes from Persia. The flower is one of the oddest in form, its brilliant petals being strongly reflexed, giving it the appearance of being turned inside out.

Cycle [from Gr. *κύκλος*, wheel, circle]: a period of time which finishes and recommences perpetually. The term has been employed for marking the intervals in which two or more periods of unequal length are each completed in a certain number of times, so that both begin again exactly in the same relations as at first. The cycles used in chronology are three: the cycle of the sun, the cycle of the moon (or Metonic cycle), and the cycle of indiction. The cycle of the sun, or solar cycle, is a period of time after which the same days of the week recur on the same days of the year. If the number of days in the year were always the same, this cycle could only contain seven years; but the order is interrupted by the intercalations. In the Julian calendar, the intercalary day returns every fourth year, and the cycle consequently contains twenty-eight years. This cycle is supposed to have been invented about the time of the first Council of Nice (325 A. D.), but the first year of the first cycle is placed nine years before the commencement of the Christian era. Hence the year of the cycle corresponding to any given year in the Julian calendar is found by the following rule: add nine to the date and divide the sum by twenty-eight; the quotient is the number of cycles elapsed, and the remainder is the year of the cycle. Should there be no remainder, the proposed year is the twenty-eighth, or last of the cycle. In the reformed calendar this rule can only apply from century to century, for the order is interrupted by the omission of the intercalary day every hundredth year. (See Dominical Letter.) The cycle of the moon is a period of nineteen solar years, after which the new and full moons fall on the same days of the year as they did nineteen years before. This cycle was invented by Meton, an Athenian astronomer, and is known as the "Metonic cycle." It contains 8,940 days, which exceeds the true length of the nineteen solar years by nine and a half hours, nearly. On the other hand, it exceeds the length of 235 lunations by seven hours and a half only. The framers of the ecclesiastical calendar, in adopting this period, altered the distribution of the lunar months, in order to accommodate them to the Julian intercalation; and the effect of the alteration was that every three periods of 6,940 days was followed by one of 6,939. The mean length of the cycle was therefore $6{,}939\frac{3}{4}$ days, which agrees exactly with nineteen Julian years. The number of the year in the cycle is called the Golden Number (*q. v.*). The cycle begins with the year in which the new moon falls on Jan. 1. To find the number of any year in the lunar cycle, or the golden number of that year, we have this rule: add one to the date and divide by nineteen; the quotient is the number of cycles elapsed, and the remainder is the year of the cycle. Should there be no remainder, the proposed year is the last or nineteenth of the cycle.

The cycle of indictions, or Roman indiction, is a period of fifteen years, not astronomical, but entirely arbitrary. Its origin and purpose are alike uncertain, but it is conjectured that it was introduced by Constantine the Great about 312 of the common era, and had reference to certain judicial acts that took place at stated intervals of fifteen years. It is considered as having commenced on Jan. 1, 313. By extending it backward to the beginning of the era, it will be found that the first year of the era corresponded with the fourth of the cycle. In order, therefore, to find the number of any year in the cycle of indiction we have this rule: add three to the date, divide the sum by fifteen, and the remainder is the year of indiction.

Cyclic Planes of a Cone: the two planes through one of the axes which are parallel to the planes of circular section of the cone. The perpendiculars to the cyclic planes through the vertex are the focal lines of the reciprocal cone. A sphere around the vertex of the cone is cut by the latter, its cyclic planes, and its focal lines respectively, in a sphero-

conic, its cyclic arcs, and its foci, and thus the reciprocal properties of cyclic planes and focal lines give rise to properties of sphero-conics which are in many respects precisely similar to those of plane conics.

Cycling: the use of the "cycle"—that is, the bicycle or tricycle—by man for self-propulsion from place to place. Cycling is practiced throughout the world for pastime, for health, for business, and for military purposes. (For explanation of the principles governing the balance and motion of cycles, see VELOCIPEDE, which is the original and generic term applied to all forms of "cycle.") That in most common use is the bicycle, a machine consisting of two tandem wheels connected by a frame upon which is a seat. It is propelled by the feet of the rider by means of cranks attached to, or connected with, the driving-wheel, and, in the motor bicycle of the present time, by a gasoline explosion motor. The tricycle is a similar machine with three wheels. Cycling was first practiced in the eighteenth century upon the hobby, or dandy, horse. This was a bicycle with wheels attached to a bar of wood rudely shaped like the body of a horse. The rider sat astride upon it and propelled it with his feet upon the ground. The Baron Drais de Saverbrunn made an improved hobby-horse which was used 1816–19 in the principal European and American cities. It was soon given up, however. In 1840–41 Kirkpatrick McMillan, a Scotchman, made a wooden bicycle with cranks, side levers, connecting rods, and pedals. It was used successfully for years, and to him belongs the honor of making the first bicycle with cranks. McMillan first tried his cranks and side levers on a tricycle in 1835. In 1846, Galvin Dalzell, another Scotchman, who had seen McMillan's machine, made a bicycle remarkably like the safety of to-day. The handle-bar, size of wheels, and rake of front fork were nearly the same. Connecting rods took the place of the present chain. With it Dalzell could outrun a fast coach upon the highway. Michaux, a Parisian carriage-builder, is reported to have built a velocipede in 1855 which was worked with cranks upon the front wheel, but Pierre Lallement made a better one, and patented it in the U. S. in 1866. Edward Gilman took out a similar patent in England a few months earlier. After this the velocipede was developed with rapidity. The first modern bicycle was built in England in 1867. This type is known as the ordinary. Its perfected form is shown in Fig. 1. Iron and steel took the place of wood in the frame and wheels. In 1874 there were in Great Britain twenty manufacturers of bicycles. The tricycle was known as early as 1828, and one is illustrated in the *English Mechanic* for May, 1866. It came into use in 1877. About 1884 the present safety came into use. Fig. 2 shows a safety of 1901 for men. The drop-frame bicycle was invented and made by Herbert S. Owen, of Washington, D. C., in 1887, and is peculiarly adapted for women. Fig. 3 shows a lady's safety of 1901 pattern, equipped as used in America.

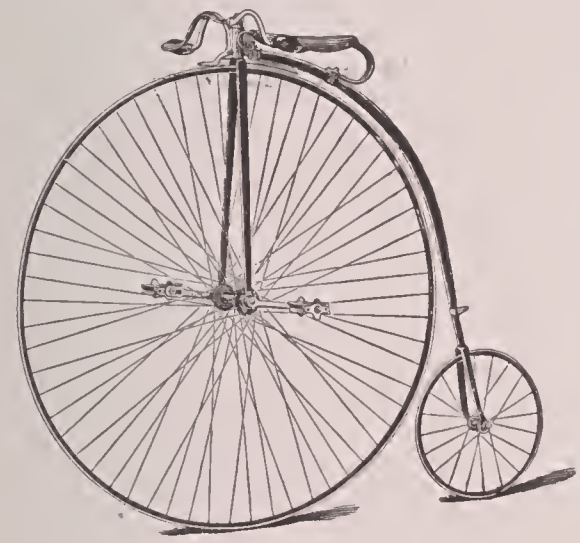


FIG. 1.—Ordinary (bicycle with solid tires).

The adoption of the safety as the permanent form of the bicycle, and of the pneumatic as its only suitable tire equipment, made possible a steady development in the construction of both. Weights were gradually reduced from above 40 lb. to 20 lb. for road, and even less; the ball-bearing principle was introduced at every point of friction; weldless steel tubing of thinner gauge displaced the experimental tubing theretofore used; forgings were substituted for castings; and every part became, as far as possible, easily attachable and detachable. The pneumatic tire was perfected with equal rapidity, and to the pioneer double-tube pattern were added several varieties of single-tube tires (in which the inner tube and its outer cover or "wearing-shoe" are vulcanized together). In 1901 an ordinary injury to either type of tire may be permanently repaired in a few minutes. Heavy suspension saddles and goosenecck posts were displaced by ladies' and gentlemen's saddles of light weight and hygienic construction. Meanwhile to the single safety was added the tandem, "triplet," "quadruplet," "sextuplet," and, in 1896, the decaplet, carrying two, three, four, six, and ten riders respectively, the first mentioned used with nearly the same facility as the single wheel, the others almost exclusively for racing and advertising.

Bicycles with bevel-gear power transmission, in place of the usual chain transmission, were introduced commercially in 1897, and have steadily grown in popularity, because of their neater appearance and the protection of the driving mechanism from mud and dust by inclosing housings. The cushion-frame device and coaster brake were brought out about the same time.

Motor tandem bicycles, for pacing purposes on the race-track, were introduced in France in 1897, and were quickly followed by gasoline motor tricycles for street and road use. American builders began making gasoline and steam tandems for pacing in 1899, and in 1900 brought out the first single bicycles for road use equipped with gasoline power. In the spring of 1901 a score of manufacturers were making such machines. They were equipped with single-cylinder air-cooled explosion motors of from $1\frac{1}{4}$ to $2\frac{3}{4}$ horse power. Motor tricycles and quadricycles are also made for road use.

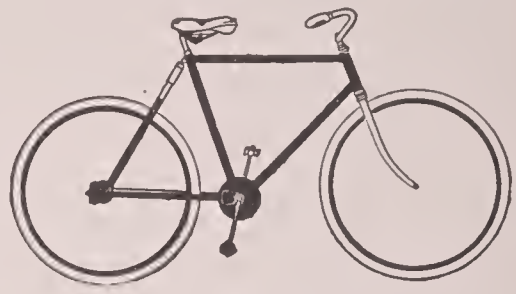


FIG. 2.—Men's chainless-gear cushion-frame safety.

The bicycle-building industry was of British origin, and for several years Great Britain supplied the best machines to all parts of the world. So great was the increase in the American trade from 1892 to 1896, however, that now the products of the factories of the U. S. exceed in value those of any other country, and while a heavy tariff practically prohibits the importation of foreign bicycles and sundries, those of U. S. manufacture are largely exported to England, France, Germany, Denmark, Sweden, Norway, Russia, Finland and other European countries, Australasia, China, Japan, South Africa, India, Argentine Republic and other South American countries.

The annual British output averages probably 500,000 machines, representing a gross value of from $20,000,000 to $25,000,000. About 100,000 more are made in the U. S., in 100 well-equipped factories, the majority being medium and low grades selling at from $35 down. In Great Britain and the U. S. there is a large amount of capital invested in bicycle factories and separate plants devoted to the manufacture of tires, materials, sundries, and fittings.

The bicycle has become a potent factor in awakening people to the necessity of better roads. The strength of half a million cycling voters is felt in the U. S. municipal, State, and national politics; and many States, notably New York, Massachusetts, New Jersey, Connecticut, Maryland, and Minnesota, are now making liberal annual appropriations for permanent highway improvement. Early in 1896 the U. S. Congress established a national bureau of highways, under the direction of the chief of engineers of the army, and the special supervision of the department of road inquiry, whose province it is to have charge of the scientific laying out of all roadways in new territory, and to aid the movement in the various States by the discovery and free testing of building materials. In addition to the impetus given the cause of improved highways by the cyclists of the U. S., thousands of miles of special side-paths for bicyclists are being built by funds raised under special bicycle tax or license laws passed in New

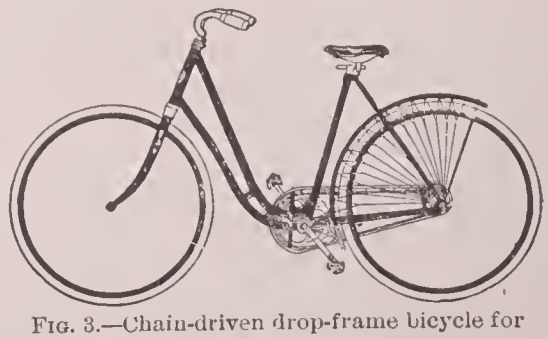


FIG. 3.—Chain-driven drop-frame bicycle for women.

York, Pennsylvania, Ohio, Minnesota, and Oregon. Rochester, Albany, St. Paul, Minneapolis, Seattle, Tacoma, and Portland each have systems comprising more than fifty miles of side-paths.

The safety type of wheel has been the subject of considsiderable experiment by the U. S. War Department, and by nearly every European government. Its usefulness in modern scientific warfare is unquestionable, but its place will

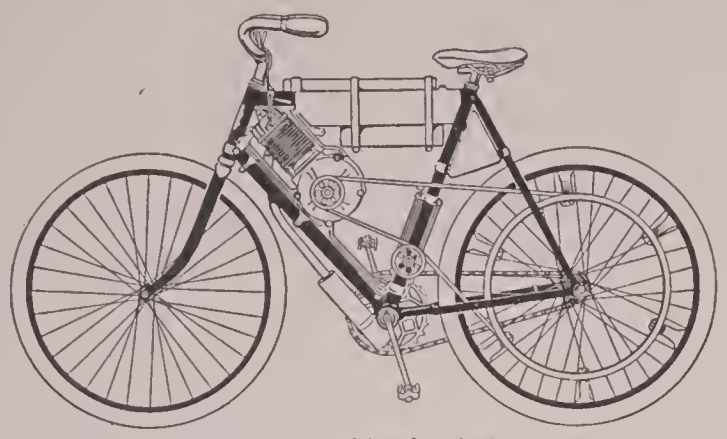


Fig. 4.—Gasoline motor bicycle of 1901 pattern.

not be so much in actual warfare as for the rapid movement of troops, for messenger service, and for skirmishing. Tests of the cycle for the carrying of dispatches over long routes have been made in Europe, but especially in the U. S. under the direction of Lieutenant-General Nelson A. Miles, commander-in-chief of the U. S. army. The national guards of several States have adopted the bicycle in their service.

There are national cycling organizations in the various countries, formed and sustained to promote touring, to advance the good roads movement, to protect the rights of its members as cyclists, and to govern the racing and in some instances the trade interests. The League of American Wheelmen and National Cyclists' Association (U. S.), the National Cyclists' Union and Cyclists' Touring Club (Great Britain), L'Union Vélocipedique and Touring Club of France, the Deutscher Radfahr Bund (Germany), the Canadian Wheelmen's Association, and the League of Victorian Wheelmen (Australia) have a combined active membership exceeding 250,000. Each association has its official organ or regular bulletin. The League of American Wheelmen has 30,000 members.

Cycle racing is a very popular sport, reaching its greatest development in France, Italy, Germany, Australia, and the U. S. In speed trials the bicycle has beaten the best time made by the running horse. International championships are held annually for the purpose of bringing together the speediest racing representatives of the various cycling countries. In 1893 these championships were held at Chicago during the World's Fair; the year following at Antwerp, Belgium; in 1895 at Cologne, Germany; in 1896 at Copenhagen, Denmark; in 1897, Glasgow, Scotland; in 1898, Vienna, Austria; in 1899, at Montreal, Canada; and in 1900 at Paris. Bicycle journals, not including club organs, are published weekly in the U. S., Great Britain, Canada, France, Germany, Italy, Australia, New Zealand, and other countries. France has two daily cycling papers, with immense circulations.

Literature.—*Around the World on a Bicycle*, by Thomas Stevens (New York, 1887); *Across Asia on a Bicycle* (New York, 1894); Lenz's *World Tour Awheel* (*Outing*, Aug., 1892–96); *Cycling for Health and Pleasure*, by Luther H. Porter (New York, 1895); *Two Pilgrims' Progress*, by Joseph and Elizabeth Robins Pennell (Boston, 1886); and *Three Men on Wheels*, by John Kendrick Bangs (Philadelphia, 1900).

C. E. Hawley. Revised by H. W. Perry, Associate editor "The Cycling Gazette."

Cy'cloid [from Gr. *κύκλος*, circle + suffix *-oid*, based on *εἶδος*, appearance; cf. *κυκλοειδής*, circle-like]: a plane curve generated by a point in the plane of a circle when the latter is rolled along a straight line. If the generating point is in the circumference of the rolling circle, a "common cycloid" is generated; if the generating point be outside the circle, it marks a "curtate" cycloid; while if it be a point within the circumference, a "prolate" or "inflected" cycloid is the result. That part of the cycloid which is generated in one revolution of the generating circle is called one "branch" of the cycloid. The branches may be infinite in number. That part of the straight line which is traversed in one revolution of the generating circle is the "base" of one branch. A line bisecting the branch of a cycloid and its base is the "axis." The common cycloid is the "line of quickest descent"—that is, if one point be placed above another, but not in the same vertical line, a falling body will move from the higher point to the lower more quickly along the arc of an inverted common cycloid than by any other course, even if that course be a straight line. If a pendulum be made to vibrate in the arc of a common cycloid, no matter what the length of the arc may be, the time will always be the same. In practice, however, this result has never been attained. Experiments show that cog-wheels with teeth bounded by this curve have their friction reduced to the minimum. See Epicycloid and Hypocycloid.

Cyclones [from Gr. *κύκλος*, circle]: whirling storms of large horizontal dimensions. The whirling character of these storms was not discovered until about the end of the first quarter of the nineteenth century. A cyclone is characterized by a center of low atmospheric pressure toward which there is a spiral inflow of air. The inflow is against the sun (contra-clockwise) in the northern hemisphere, oppositely in the southern. A cyclone is meteorologically a "storm" but it varies through all degrees of gentleness and severity. (See Storm, Storm-area, Hurricane, and Typhoon.) These large storm-areas are often accompanied by smaller ones called "secondaries," and the latter, when severe, have popularly, but erroneously, received the name of cyclones. See Tornado, Thunderstorm, and Hailstorm.

Cyclopædia [abbrev. of *encyclopædia* = Gr. *ἐγκυκλοπαιδεία* for *ἐγκύκλιος παιδεία*, the circle of arts and sciences composing the standard education of a free-born citizen, the liberal curriculum]: properly, a work which takes in the whole circle of learning. The term is often, though incorrectly, applied to a work treating very fully of some one or two important subjects, as a *Cyclopædia of English Literature*, the *Cyclopædia of Anatomy and Physiology*, etc. See Encyclopædia.

Cyclo'pean Walls: huge structures or walls of uncemented stones, the remains of which are found in Greece, Italy, and Asia Minor. These structures were so-called because they were supposed to have been built by the Cyclopes of mythology. The architecture is very different from that of the historic period. Some persons believe that they were erected by the Pelasgi, more than 1,000 years before the Christian era. The Cyclopean walls at Tiryns in the Peloponnesus are formed of unhewn stones from 6 to 9 feet long, and nearly 3 feet thick. At Mycenæ are found massive walls of stones, which are more accurately fitted and are specimens of an architecture less rude than that of Tiryns. A more advanced style of architecture appears in some remains of Etruria. In the Etruscan masonry called Cyclopean the stones are hewn or squared and laid in horizontal courses, but are not cemented.

Cy'clopism: that form of monstrosity or malformation of the fœtus in which only one eye is present, usually on the median line of the head. See Teratology.

Cy'clops [Gr. *Κύκλωψ*, literally, round-eyed; *κύκλος*, circle + *ὤψ*, eye], plu. **Cyclo'pes**: in classic mythology, a race of giants or monsters having each one eye in the middle of the forehead. According to Hesiod, they were the sons of Uranus, and were named Brontes, Arges, and Steropes. Homer represents them as gigantic and lawless shepherds and cannibals who lived in Sicily. The most famous among them was Polyphemus.

Cyclops: a genus of copepodous *Entomostraca*; so called from the fact that its two eyes are united in the middle line. It has a shrimp-like body, the anterior segments being united into a cephalothorax, the posterior forming a jointed abdomen. The species are minute, and are very abundant in fresh water, but none occur in the sea. They form an important element in the food of many fishes. About twenty species are described from the U. S. J. S. K.

Cyclops.

Cyclo'sis: See Protoplasm.

Cyd'nus (in Gr. *Κύδνος*): a river of Cilicia, flowing through the city of Tarsus into the Mediterranean. It was

celebrated for the clearness and coldness of its water. It was anciently navigable up to Tarsus (12 miles), but its mouth is now obstructed by bars. This river was the scene of Cleopatra's celebrated voyage to meet Antony in 41 B. C.

Cydo'nia: an ancient city of Crete; on the northwestern coast of the island. It was noted for the production of the quince (*Cydonia*).

Cyg'nus (the Swan): a constellation of the northern hemisphere in the Milky Way, between Lyra and Cassiopeia; comprises several bright stars, five of which form a cross. The parallax of the binary star 61 Cygni was measured by Bessel, who published in 1839 *Measure of the Distance of the Star 61 in the Constellation of Cygnus.*

Cylinder [from Gr. *κύλινρος*, from *κυλίνδειν*, roll]: in elementary geometry, a solid bounded by two equal and parallel circles or ellipses, forming its bases, and a curve surface generated by the motion of a straight line, called the *generatrix*, which moves around the circumferenee of the bases so as to remain always parallel to itself. If the generatrix is perpendieular to the bases, the cylinder is *right*; if not, it is *oblique*. It is ealled *circular* or *elliptic*, aecording to the figure of the bases. A noteworthy property of this solid is that its contents are to those of the inscribed ellipsoid in the ratio of 3 to 2, a property diseovered by Archimedes in the special case when the cylinder circumseribed a sphere.

Cylle'ne (in Gr. Κυλλήνη): a mountain of Greece; in the northwestern part of Areadia; was supposed to be the birthplace of Mercury (Hermes), who was called *Cyllenius*, and had a temple on its summit. Height above the sea, 7,788 feet. It is now called *Zyria.*

Cy'ma [from Gr. *κύμα*, a wave]: in architecture, a molding having a wave-like profile of double curvature. When the farthest projecting portion of the molding is concave and that nearest to the wall convex, it is called a *cyma recta*; when this succession is reversed, a *cyma reversa.*

Cymbal [from Gr. *κύμβαλον*, from *κύμβος*, hollow]: a brass musical instrument of percussion, circular in form and about 8 inches in diameter. Cymbals are played in pairs by striking one against the other, and produce a loud, harsh sound of no fixed pitch. The best are those made in China and Turkey. Cymbals were employed by the Greeks in the festivals of Baechus and Cybele.

Cyme [from Lat. *cyma*, sprout = Gr. *κῦμα*, fœtus, sprout, deriv. of *κύειν*, become pregnant]: a flat-topped or convex centrifugal infloreseence—viz., one in which the central flower of eaeh cluster or division opens first, that flower terminating the axis. Linnæus restrieted the name to compound infloreseence of this sort, of which the elder (*Sambucus*) and *Viburnum* offer well-marked examples; but modern botanists, making the distinction between flowers from axillary and from terminal buds, employ it as a general term for all forms of inflorescence of the latter kind.

Cymophane: See Chrysoberyl.

Cymric Literature: same as Kymric Literature (*q. v.*).

Cymry: same as Kymry (*q. v.*).

Cynan'chum [from Gr. *κύων*, dog + *ἄγχειν*, choke, i. e. dog-bane]: a genus of plants of the family *Asclepiadaceæ. Cynanchum acutum*, found on the shores of the Mediterranean, produces the Montpellier scammony. Caoutchouc is obtained to some extent from the *Cynanchum ovalifolium*, a native of Penang. Other species have been used in medicine.

Cynewulf, or **Coenewulf**: an Anglo-Saxon religious poet of the eighth century; author of a collection of *ænigmata*, or riddles; of a life of St. Helena (Elene); and a *Christ.* Other poems are more doubtfully attributed to Cynewulf, sueh as lives of St. Guthlae and St. Juliana and a *Vision of the Cross*; also a translation of the *Phœnix*, a Latin poem ascribed to Lactantius. Henry A. Beers.

Cynics [from Gr. *κυνικοί*, dog-like, deriv. of *κύων*, dog; this name, probably first suggested by the name of the place where they taught, Κυνόσαργες, was applied to them on account of their filthy appearance and disagreeable manners]: a sect of philosophers among the Greeks, so called from their dog-like temper and their disregard of the conventional usages of society. It is difficult to give any satisfactory account of the tenets of this sect, as during all the period of its existence it was in a state of constant fluctuation. Its professed aim was to inculcate the love of rigid virtue and a contempt of pleasure. On this point the testimony of Horace —himself a zealous adherent of the school of Aristippus, the very opposite of the cynical sect—even were there no other, must be held conclusive; and according to his opinion the aim of the cynical philosophy was to induce every man to become "the guardian of real virtue." Diogenes belonged to this sect. It was founded in the fifth century B. C. by Antisthenes, a disciple of Socrates, who sought to imitate his master in disregard of outward splendor and contempt of riches, but his indifference to these things soon degenerated into an ostentatious display of singularity.

Cynoceph'alus [from Gr. *κύων*, dog + *κεφαλή*, head]: in Egyptian mythology, a dog-faced baboon. The Egyptians held these animals in great veneration, and professed to discover by their aid the periods of the sun and moon. The name is now applied to a genus of African monkeys. See Baboon.

Cynogale [from Gr. *κύων*, a dog + *γαλῆ*, a weasel]: a singular member of the civet family (*Viverridæ*) found in Borneo, Sumatra, and Malacca, known scientifically as *Cynogale bennetti*, locally in Borneo as the mampalon. It is about 2½ feet long, covered with thick, soft, dark-brown fur. The muzzle is long, much swollen near the end, and the toes are webbed. The animal both swims and climbs well. It feeds upon fish, crabs, small mammals, birds, and fruit.

F. A. Lucas.

Cynosceph'alæ: a locality in Thessaly; was the scene of two important battles. In the first the Thebans defeated the tyrant of Pheræ, in 364 B. C. In the second the Roman general Flamininus defeated Philip of Macedon in 196 B. C.

Cynosu'ra [from Gr. *κυνόσουρα*, name of the constellation; *κυνός*, genit. of *κύων*, dog + *οὐρά*, tail—probably because four stars of Ursa Minor, including the North Star, were fancied to resemble a dog's tail]: a nymph of Ida, said to have been one of the nurses of Jupiter, who translated her into the constellation of Ursa Minor, which includes the North Star. In the language of poetry it signifies a "point of attraction."

Cynthiana, sin-thi-aa'na: city (settled in 1780); capital of Harrison co., Ky. (for location of county, see map of Kentucky, ref. 2–H.); situated on the South Fork of the Licking river, and on the Kentucky Central R. R.; 66 miles S. of Cincinnati, Ohio. It has several churches, a graded free school, a female college, two flouring-mills, and two carriage-factories, and is noted for the manufacture of "Bourbon" whisky. It is in a very fertile agricultural district, and is the site of a famous race-course. A Confederate force numbering 2,200 men, with artillery, under Gen. J. H. Morgan, attacked the city July 17, 1862, garrisoned by 350 Federal soldiers. It was surrendered, but not till the ammunition was exhausted. On June 11, 1864, Morgan with a large force, attacked the place again, and after two days' fighting captured Gen. Hobson with some 1,700 men. On the 14th Gen. Burbridge, with 7,000 men, fell upon Morgan (whose men were out of ammunition and exhausted), and drove him out of Cynthiana with considerable loss. Pop. (1880) 2,101; (1890) 3,016; (1900) 3,257.

Cypera'ceæ: See Sedge Family.

Cype'rus [Lat., from Gr. *κύπειρος*, name of a marsh-plant]: a genus of plants of the family *Cyperaceæ*, distinguished by hermaphrodite flowers and compound spikes of numerous two-rowed glumes, without bristles. It contains numerous species, many of which are natives of the tropics, and others of the U. S. Some of them have tubers or corms which are mucilaginous and nutritious. The *Cyperus esculentus* (rush-nut), a native of Southern Europe, is cultivated in Italy, Spain, and France, and bears farinaceous tubers which are as large as a hazel-nut, and are called *amande de terre* (ground almond) by the French. They are eaten as dessert, and are used in making orgeat. The papyrus plant is often referred to this genus, though separated from it by some botanists.

Cypher: See Cipher.

Cy-pres Doctrine, see'prā-dok'trin: the doctrine or rule of equity that where a testator manifests a general intention, and has adopted a particular mode of carrying his general intention into effect, which, however, is contrary to law, or impossible of fulfillment, then the general intent will be given effect as nearly as may be consistently with the rules of law. The doctrine is more particularly applied to cases of charitable bequests, where the particular form or manner of charitable disposition of the property is or becomes impossible, in which case another mode consistent with the gen-

eral intent will be adapted, so as to substantially give effect to it, if not in the exact mode indicated. It is also applied so as to modify the strictness of the common law in the case of personal legacies upon conditions precedent, in which case it is held sufficient that the condition is complied with as nearly as it practically can be, where a literal compliance is or becomes impossible or contrary to law. The doctrine is derived from the civil law, and rests upon the assumption that it gives effect to the real intention of the testator, who is presumed not to have intended that the impossibility of a literal compliance with his directions should defeat the general object of his bequest. The application of the doctrine has in some cases been carried to an unreasonable extent. The various States of the Union differ in their attitude toward it, some approving of its application, and some repudiating it. All of the New England States, except Connecticut, have approved it. In New York, Indiana, Iowa, and other States, it has been repudiated in whole or in part, and in still other States it has not been decided upon. See INTERPRETATION. F. STURGES ALLEN.

Cypress [from O. Fr. *cypres* < Lat. *cyparis'sus*, *cuparissus*, cypress-tree = Gr. κυπάρισσος, a name of Semitic origin, cf. Heb. *gopher*]: evergreen trees and shrubs of the genus *Cupressus* of the family *Pinaceæ*. (See CONIFERS.) About a dozen species are known, natives of temperate Asia, Southern Europe, Western North America, and Mexico. The genus is characterized by having globose cones, composed of shield-shaped, valvate scales, each with numerous ovules, seeds narrowly winged, embryo with two (rarely three or four) cotyledons, opposite, evergreen awl-shaped and scale-shaped leaves, each usually with a dorsal resin-gland. The best-known species is the cypress of the Old World, *Cupressus sempervirens*, an upright, narrow, tapering tree with erect branches and a dark-green foliage. It is hardy in the Southern U. S. and the south of England. The Monterey cypress, *C. macrocarpa*, of California is a more spreading tree, of rapid growth and much greater hardiness. It is one of the finest of the cypresses. *C. funebris* of China has widely spreading, horizontal, and at length pendulous branches. Cypress wood is very durable, and specimens are known which are said to be several thousand years old. The deciduous or bald cypress, *Taxodium distichum* of the swamps of the Southern U. S., is a tall tree with spreading branches, which bear linear, deciduous leaves. Its wood is soft but durable, and the tree is much planted for timber and ornamental purposes. It commonly sends up from its roots curious, hollow, conical growths ("knees") which rise a yard or more above the ground. Their function is unknown. C. E. B.

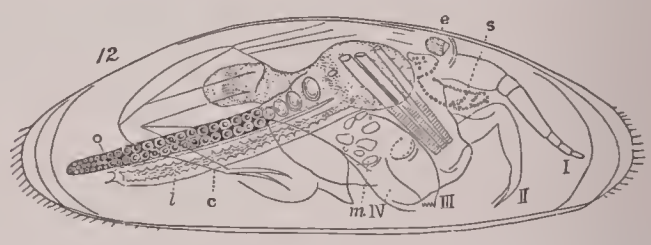
Cyp'rian, SAINT (more fully, **Thas'cius Cæcil'ius Cypria'nus**): a bishop of Carthage and Latin Father of the Church; a native of Africa; b. about 200 A. D. He was a teacher of rhetoric before his conversion, which occurred about the year 246, and he was chosen Bishop of Carthage in 248 A. D. In 250 he retired into the desert to escape from the persecution which was ordered by the Emperor Decius. He returned to Carthage in 251, and then assembled a council on the subject of apostates who had lapsed in consequence of persecution. He judged that these should be treated with moderation and lenity. He emphasized the idea of the Church, insisted upon the three orders of the ministry, and stoutly maintained the parity of bishops against the claims of the Bishop of Rome. He suffered martyrdom under Valerian, by beheading, Sept. 14, 258 A. D. He was eminent for his learning, eloquence, and zeal, wisely tempered with moderation. His works consist of thirteen treatises, the most important of which is his *De Catholicæ Ecclesiæ Unitate*, written in 252, besides eighty-one epistles, including a few addressed to him, all of which have reference to ecclesiastical affairs. See his *Life* by G. A. Poole (Oxford, 1840), and by Peters (Regensburg, 1877); cf. O. Ritschl, *Cyprian und die Verfassung der Kirche* (Göttingen, 1885). Best ed. of his works by W. Hartel (3 vols., Vienna, 1868–71; Eng. trans., *Ante-Nicene Fathers*, v. 263–596).

Cyprin'idæ [from *Cyprinus*, the longest known genus, to which the carp belongs]: the carp family; an enormous group of fresh-water species, about 1,000 species in all, found in the rivers of Europe, Asia, Africa, and North America. They are soft-rayed fishes, with smooth or cycloid scales, and with no teeth in the mouth, the lower pharyngeal bones (modification of the posterior gill arches) being armed each with from four to eight highly specialized teeth. To this family belong the carp, roach, dace, tench, barbel, gudgeon, goldfish, and the great array known as chubs, minnows, shiners, fallfish, and the like. They are tasteless fishes, and full of small bones, hence of little value as food, but useful as food of predatory fishes. Most of the species found in the Eastern U. S. are small, under 4 inches in length, the fallfish, which reaches 18 inches, being the largest. On the Pacific slope these fishes reach a much greater size, one species of *Ptychocheilus* in the Colorado reaching a length of 5 feet, and being the principal food-fish in the river. DAVID S. JORDAN.

Cyprinodon'tidæ [from Gr. κυπρῖνος, carp + ὀδούς, ὀδόντος, tooth]: a family of soft-rayed fishes, superficially resembling the *Cyprinidæ*, but with the jaws provided with teeth and the pharyngeals entirely different. To this family belong the various species known as top-minnows, mummichogs, killifishes, etc., abounding in brackish waters in most parts of the world, and often ascending rivers to the fountain-heads. Many species are viviparous, some are herbivorous, and some are extremely small. DAVID S. JORDAN.

Cypripedium [from Gr. Κύπρις, Venus + Lat. *pes*, *pedis*, foot]: a genus of plants of the family *Orchidaceæ*; remarkable for having two lateral and perfect anthers and another forming a dilated fleshy appendage above the stigma; also for having the lip or labellum large and somewhat pouch or slipper shaped; hence the popular name lady's slipper. About forty species are known, all terrestrial in habit, ranging from the tropics to the colder regions of the northern hemisphere, and often found in bogs or in hilly woods. Eight or nine species are indigenous in the U. S., the most common being *C. acaule*, the moccasin flower. This ranges from the Carolinas into Canada, and has a large purple-pink flower. The largest species, *C. spectabile*, often 2 feet high, has from one to three purple-pink or almost white blossoms.

Cypris [from Gr. Κύπρις, Venus]: a genus of ostracod *Entomostraca*, occurring in both fresh and salt water. The species are minute, have seven pairs of appendages, and are



Animal of Cypris in the shell, after Claus; enlarged: *c*, caudal fork; *e*, eye; *l*, liver; *m*, muscle; *o*, ovary; *s*, shell gland; I, II, III, IV, appendages.

inclosed in a horny bivalve shell. The species are very numerous in both recent waters and in the rocks of almost all formations. J. S. KINGSLEY.

Cy'prus (in Turk. *Kibris*; Gr. Κύπρος): an island of Asia, in the northeast corner of the Mediterranean; 44 miles S. of Cape Anamoor in Anatolia, and about the same distance W. of the coast of Syria. It is about 140 miles long, and 50 miles broad at the widest part. Area, 3,584 sq. miles. The interior is occupied by a range of mountains, the highest points of which rise nearly 7,000 feet above the sea. These mountains are of limestone formation. The soil is generally very fertile, but the island is not liberally supplied with water. The staple products are cotton, wheat, linseed, olives, silk; also grapes and other fruits. Wine of good quality is also made. In ancient times Cyprus was devoted to the worship of Aphrodite or Venus, who was fabled to have here risen from the sea. Her temple was at Old Paphos, now called *Kuklia*. The original occupants of the island were probably the Japhetic Kittim (Gen. x. 4), who left their name in the old capital, Citium. Cyprus, scarcely ever for any great length of time independent, was held by the Phœnicians from about 1100 to 725 B. C.; by the Assyrians from about 700 to 650 B. C.; by the Egyptians from about 550 to 525 B. C.; by the Persians from 525 to 333 B. C.; and then, after 323 B. C., by the Ptolemies till 58 B. C., when it became a Roman province. In 44 A. D. it was visited by Paul in his first missionary tour. The Saracens (from 649 A. D.) took and retook it several times. Wrested from the Saracens by Richard Cœur de Lion in 1191, it was governed by kings of its own from 1192 to 1489, and belonged to Venice from that time till 1573, when it was conquered by the Turks. In 1878 the island was ceded to England in consideration of an annual pay-

ment to the Porte of £92,800. (See BERLIN CONGRESS). In 1882 a constitution, with an elected council, was granted to Cyprus. Perhaps no country on the globe has changed masters so many times, or holds within its bosom the relics of so many civilizations.

For many years Cyprus has been a hunting-ground for archæologists. The *Codex Cyprius*, containing the unmutilated Gospels, was found here in the ninth century, and was carried to Paris in 1673. Pococke saw ruins and tombs; the Abbé Mariti, who visited the island in the latter part of the eighteenth century, describes marbles, medals, idols, and lamps, but the Turks would not permit diggings. Later a number of silver bowls were found, one of which, now in the collection of the Duc de Luynes, closely resembles those found by Layard at Nimroud. In 1845 a bas-relief in black basalt was found at Larnica, upon which is sculptured the figure of Sargon, King of Assyria, father of Sennacherib. This bore the inscription in cuneiform letters, "From the great King Sargon to his vassal friend, the King of Citium." Excavations begun about 1870 by Gen. Louis P. di Cesnola, resulted in the finding of statuettes and other objects, including those comprised in the Cesnola collection in the Metropolitan Museum of Art in New York city. The population was (1891) about 209,300. The inhabitants are orderly and easily ruled. A large portion are Greeks. Capital, Nicosia. See works on Cyprus by Lang, Hepworth Dixon, and Sir Samuel Baker; also vol. iii. of *L'Art et l'Antiquité en Orient*, by Perrot and Chipiez (Eng. trans. 1885).

Cyrena'ica (in Gr. Κυρηναία): the ancient name of a region of Northern Africa, now known as BARCA (*q. v.*). It is also called Pentapolis, from its five cities, Cyrene, Apollonia, Teuchira, Hesperides, Barca; afterward Cyrene, Apollonia, Ptolemaïs, Arsinoë, Berenice. The principal city was Cyrene, from which the name was derived. Cyrenaica was bounded on the W. by Africa Propria, on the E. by Marmarica, and extended southward as far as Libya Inferior. The original inhabitants, now represented by the Berbers, were probably descendants of Phut, the third son of Ham (Gen. x. 6). The Greeks began to colonize this part of Africa about 631 B. C. Till 430 B. C. Cyrenaica was governed by a dynasty of eight kings, four of whom bore the name of Battus, and four the name of Arcesilaus. A democratic republic was then established. In 332 B. C. the people submitted to Alexander. Under the Ptolemies many Jews settled there. In 75 B. C. Cyrenaica became a Roman province, and afterward a part of the Byzantine empire. In 616 A. D. it was conquered by the Persian Chosroes (Khosroo), in 647 was overrun by the Arabs, and now is under the rule of the Turks, whose authority, however, is hardly more than nominal.

Cyre'ne (in Gr. Κυρήνη): the capital of Cyrenaica; situated about 10 miles from the Mediterranean, and 1,800 feet above the level of the sea. It was founded about 631 B. C. by a colony of Spartans. Cyrene carried on an extensive commerce with Egypt and Greece through its port called Apollonia. The site is now occupied by *Grenne* or *Kurin*.

Cyriacus of Ancona: See KYRIACUS.

Cyr'il, or **Cyril'lus**, SAINT: Bishop of Jerusalem; b. probably at Jerusalem in 315 A. D. He was ordained a deacon in 334 or 335, a presbyter in 345, and became Bishop of Jerusalem in 350 or 351. Acacius, Bishop of Cæsarea, who was an Arian and an enemy of Cyril, caused the latter to be deposed by a council in the year 358. He was restored in 359, again deposed in 360, again restored in 362, deposed the third time in 367, and the third time restored in 368. He is said to have predicted the failure of Julian's attempt to rebuild the Jewish temple in 363. D. in Jerusalem, Mar. 18, 386. The best editions of his works are by Milles, Oxford, 1703, and by Touttée (Benedictine), Paris, 1720, reprinted in Migne's *Pat. Gr., XXXIII.* His writings are of especial value for questions of Christian archæology and liturgy. Chief of them is his *Catechetical Lectures*, Eng. trans. in *Nicene and Post-Nicene Fathers*, vol. viii.

Cyril, or **Cyrillus**, SAINT: one of the fathers of the Greek Church; b. at Alexandria, in Egypt. He was the nephew of the famous Patriarch of Alexandria, Theophilus, and succeeded him after some opposition in 412. Doubtless he inherited some of his uncle's severe and uncompromising spirit. The chief authority for his life, the historian Socrates, has been accused of one-sidedness in the narration of the details of Cyril's life, on account of his sympathy for the Novatians (see NOVATIAN). Cyril expelled the Jews from the city (416), but gave as his reason their violent assaults upon the Christians. He is best known for the part he took in the Nestorian controversy. He presided over the Council of Ephesus in 431, which deposed Nestorius. D. in Alexandria, June, 444. His voluminous writings are found in Migne's *Patrologia Græca, LXVIII.-LXXVII.* (reprint of edition of Aubert, Paris, 1638). The confutation of Julian the Apostate, in ten books, written in 433, is especially interesting. Cf. his *Life* by J. Kopallik (Mainz, 1881), and Charles Kingsley's *Hypatia*. There is an English translation of his commentary on Luke (Oxford, 1859), and of his *Five Tomes against Nestorius* (1881). J. J. KEANE.

Cyril, originally called **Constantine**: son of Leon of Thessalonica, and elder brother of Methodius; b. 827 A. D. About 850 Cyril went as a missionary among the Chazars in the Crimea; in 861 Methodius went to Bulgaria; and in 863 the two brothers went together to Moravia. They were the apostles of the Slavic race. Cyril invented the alphabet and translated into the Slavic language the Psalter and all of the New Testament, except the Apocalypse. In 868 he obeyed the pope's summons to Rome to explain their conduct in conducting services in the vernacular and not in the Roman tongue, and won the pope to their side, but retired to a monastery in the city, became a monk, taking the name of Cyril, and there died Feb. 14, 869. See J. A. Ginzel, *Geschichte der Slawenapostel Cyril und Method* (Leitmeritz, 1857; 2d ed. Vienna, 1861).

Cyrillic Alphabet: an alphabet invented about 863 A. D. by St. Cyril, the apostle of the southern Slavi. It was based upon the older Glagolitic alphabet. Some writers, however, make the Glagolitic the invention of Cyril, while the so-called Cyrillic they consider to be the invention of Clement, Bishop of Welitza, who died in 916 A. D. The Cyrillic, with a number of modifications, is the alphabet used in Russia and some other Slavic countries.

Cyril Lucar: Patriarch of Constantinople; b. in Crete, probably in 1572; studied at Venice and Padua, and lived a long time in Switzerland, particularly in Geneva. He was greatly attracted by the Reformed doctrine, and so, although he became a Greek Patriarch of Alexandria in 1602, and was transferred to Constantinople in 1621, he tried to effect a union between the Greek Church and the Protestant doctrines. To this end he published his *Confession* in Latin in 1629, in Greek in 1631, and in both languages at Geneva in 1633. The work is essentially Calvinistic, and his boldness stirred up great opposition. Five times was he deposed and five times reinstated. Finally in 1638 he was accused of high treason, and by order of the sultan he was strangled and his body thrown into the Bosphorus. His doctrines were repeatedly anathematized after his death. It was he who in 1628 sent to Charles I. of England the famous CODEX ALEXANDRINUS (*q. v.*).

Cy'rus the Elder, surnamed THE GREAT: founder of the Persian empire; the fourth in lineal descent from the first King of Ansan (or Elam), the mountainous country E. of Babylonia. In the early part of his reign as King of Ansan, B. C. 549, he was attacked by Astyages, King of Media, but he defeated him and took his capital, Ekbatana (now Hamadan). Within the next three years he obtained possession of Persia, and so styled himself "King of Persia" (546). He then conquered Lydia (540), and ventured against the Babylonians. Nabonidus, the King of Babylonia, lived in Teva, a quarter of Babylon on the western bank of the Euphrates, and sent his son Bil-sana-ut-sur, called Belshazzar (Dan. v.), with the army to Sippara, in Northern Babylonia. In 538 Cyrus advanced into Akkad (Northern Babylonia). Nabonidus went to Sippara, but the city was by treachery delivered into the hands of Cyrus "without fighting" (June 14, 538). Nabonidus fled. On June 16 similar treachery opened the gates of Babylon, and the soldiers of Cyrus "without fighting" entered Babylon. On the 3d of the next month Cyrus entered the city. With the conquest of Babylonia Cyrus was supreme ruler from the Mediterranean Sea to the mountains of Hindustan. In 529 he died upon a military expedition. He left two sons, Cambyses, who succeeded him, and Smerdis, and several daughters.

The above account is based upon cuneiform inscriptions deciphered since 1880, and can doubtless be relied upon. It differs widely from the account given by Herodotus (bk. i.), which briefly is this: The father of Cyrus was Cambyses, a Persian nobleman; his mother was Mandane, a

daughter of Astyages, King of Media. Before her marriage Astyages dreamed that from her a stream of water flowed forth as not only to fill his capital, but to flood the whole of Asia—hence he married her to a man whom he considered much inferior to a Median, thinking thereby to defeat the prophecy. But before her child was born he had another dream. This time he fancied that he saw a vine grow out of his daughter which overshadowed the whole of Asia. He was alarmed lest his daughter's son should cast him down from his throne, and accordingly had his daughter removed to his palace. When her child was born he commanded an officer named Harpagus to kill Cyrus. Harpagus promised to obey the order, but privily committed the infant to the care of a herdsman, who brought him up with his own children. Cyrus, having discovered the secret of his birth, and having inured himself to the hardy habits of the warlike Persians, incited the latter to revolt against the King of Media. He defeated Astyages in battle, and ascended the throne. He conquered Crœsus, King of Lydia, and extended his dominions by the conquest of other states. Among his exploits was the capture of Babylon, by diverting the river Euphrates from its channel while Belshazzar was feasting.

The name of Cyrus occurs in Is. xliv. 28; xlv. 1, or prior to his birth, as those believe who hold to the unity of the book. There is also an allusion to his capture of Babylon, Is. xlv. 1, and as there is no mention of fighting it agrees with the statement quoted above. Similarly the allusion to the capture in Dan. v. 30, 31, looks toward treachery, not a siege as Herodotus relates, confounding probably the siege under Darius with the capture by Cyrus. The inscriptions make it plain that Cyrus was a polytheist and idolater. Yet he was no bigot, but practiced religious toleration. He issued an edict that the Jewish captives who had been deported to Babylon should return to Jerusalem and rebuild their temple (Ezra i. 1–4). Herodotus states that he afterward invaded the country of the Scythian Massagetæ, who were ruled by Queen Tomyris, and that he gained several victories over her, but was drawn into an ambush and killed in 529 B. C. According to Xenophon, Cyrus died a natural death at Pasargadæ. About his name legends and myths have clustered. These are found related in Herodotus and Xenophon, whose *Cyropædia* is a romance which has him for a hero. See the cuneiform inscriptions translated in *Records of the Past*, new series, vol. v. (1892), pp. 144–176.

SAMUEL MACAULEY JACKSON.

Cyrus the Younger: the second son of Darius II. Nothus, King of Persia; b. about 424 B. C. His father made him satrap of Lydia and Phrygia in 407 B. C. Accused of conspiring against his elder brother, Artaxerxes Mnemon, who had succeeded his father as king, he was pardoned and continued in office. As satrap, however, he collected a large native army and hired 13,000 Greek mercenaries, of whom Clearchus, a Spartan, was the leader, and among whom was Xenophon the historian. In the year 401 B. C. Cyrus moved his army from Sardis, but kept his soldiers in ignorance of their destination. He met the army of Artaxerxes at Cunaxa, where, rashly exposing himself in the front, he was killed, about Sept., 401 B. C. His character is praised by Xenophon. The retreat of his Greek mercenaries is immortalized in Xenophon's *Anabasis*.

Cyst [from Gr. *κύστις*, bladder]: a hollow tumor or pathological structure in the form of a bladder. The name is also applied to hollow organs with thin walls, as the gall and urinary bladders. Pathological cysts are frequently transparent and of great tenuity. They are mostly lined by an epithelium, and are either simple or compound.

Cysticer'cus: See HYDATID.

Cystidea: an order of crinoid-like forms of Echinoderms occurring only as fossils in the rocks from the Lower Silurian to the Carboniferous. They were attached, either directly or by the intervention of a stalk, and had an oval or globular body, and frequently weakly developed arms. See CRINOIDEA.

J. S. K.

Cysti'tis [from Gr. *κύστις*, bladder]: inflammation of the bladder. It may be acute or chronic. It is more frequent in men than in women. It may be the result of blows, kicks, bruises, punctured or incised wounds. It also occurs from holding the urine too long, from urine which is irritating—either highly acid or very alkaline—or from the irritation of calculus and gravel in the bladder. In old men it results from enlarged prostate (neck of the bladder), and in women from inflammation and diseases of the uterus and pelvic cellular tissue. The symptoms of an acute case are chilliness, fever, nausea and vomiting, prostration of strength, pain and sense of heat over the bladder, constant desire to urinate, often with inability to do so, and the voiding of urine thick and creamy like pea-soup. The treatment consists in applying, in some cases, ice-packs over the bladder; in others, hot poultices and fomentations sprinkled with laudanum, opiates and chloral by the mouth to allay pain, the free use of alkaline and demulcent drinks, and in withdrawing the urine by the catheter twice daily, washing out the bladder with tepid or cool water, medicated or carbolated.

Czar [Russ. *tsar*, like Germ. *Kaiser*, from Lat. *Cæsar*]: the title of the Emperors of Russia. As early as the twelfth century this title was given by the Russian annalists to the Grand Duke Vladimir and his successors, but it was not officially used till the sixteenth century. The title cesarewitch was introduced in 1799 by Paul I., who bestowed it upon his second son, and the titles of cesarewitch and cesarevna are still applied to the heir-apparent and his wife. In Russia the popular appellation of the sovereign is Gossudar (Hospodar, "lord"). The term white czar is one of great antiquity, and signifies an independent czar.

Czartorys'ki, chaär-tō-ris'kĕe, ADAM GEORGE, Prince: Polish patriot; a son of Prince Adam Casimir, president of the Polish Diet; b. at Warsaw, Jan. 14, 1770; educated at Edinburgh and London. He fought against Russia in 1794, was taken to St. Petersburg as a hostage, and gained the favor of the Grand Duke Alexander, who appointed him assistant minister of foreign affairs in 1802, which position he resigned in 1808. In the revolution of 1830 he supported the Poles against Russia, and was elected president of the new government Jan., 1831, but after the defeat of the Poles in August of that year went into exile, continuing to labor for his country, and refusing an amnesty offered by Alexander II. D. in Paris, July 16, 1861.

Czaslau, chaas'low: a town of Bohemia; 40 miles E. S. E. of Prague (see map of Austria-Hungary, ref. 3–E). It has manufactures of beet-sugar and spirits, and a church with the highest spire in Bohemia (290 feet). At Chotusitz, 2½ miles N. of Czaslau, Frederick the Great defeated the Austrians May 17, 1742. Pop. 8,388.

Czech Language: See SLAVIC LANGUAGES.

Czech Literature: the literature of the Czecho-Slavs, i. e. the Slavic portion of the population of Bohemia, Moravia, and Silesia. To the same stock really belong the Slovaks in Northwestern Hungary; but since the beginning of the nineteenth century they have endeavored to keep themselves distinct from the other Czechs, and now their literature requires separate treatment. (See SLOVAK LITERATURE.) Of the three provinces named above, Bohemia is far the most important, and Czech literature is in the main the literature of Bohemia.

The Czechs entered the circle of the civilized world at the time of their conversion to Christianity by Cyrillus and Methodius, the Greek apostles to the Slavs, in the second half of the ninth century. They had already come into slight contact with Latin Christianity, but their real conversion was due to the Greek Church. Hence their first acquaintance with letters was under Greek influence. They adopted the Cyrillic script, and this survived among them for several centuries. It does not appear, however, that during this period they created what can be called a literature. During the romantic revival of national feeling in the first half of the nineteenth century, to be sure, certain supposed discoveries of ancient manuscripts led many Czechs to believe that their race had had a literature even before it became Christian. Such were the *Königinhofer MSS.* containing fragments of early epic songs; the *Judgment of Libuša* (*Libušin soud*); the Old Czech glosses in the so-called *Mater-Verborum*, a glossary of the thirteenth century; and the *Görlitz Fragments* of a very early translation of the Gospel of John. Suspicious circumstances about the finding of these manuscripts, however, as well as the character of them, led almost at once to a doubt as to their authenticity; and now, after a vehement literary controversy of more than half a century, few Czech scholars still declare their belief in them.

The real literature of the Czechs did not begin until after Greek Christianity had yielded to Latin. This process began as early as the tenth century, and was helped on by two influences—first, the introduction into Bohemia of Roman Catholic Slavs from Bosnia and Dalmatia, bringing

their so-called *glagolitic* (Slavonic *glagol* = word) manner of writing; and second, the political and social Germanization of the Czechs. The first of these influences led to the gradual abandonment of Greek rites and of the Cyrillic script, the visible signs of connection with Byzantine civilization; and by the end of the eleventh century both had disappeared in all but the remote parts of the Czech land. The Germanization of the Czechs was a slower matter; but it went constantly on, owing to the German connections of the ambitious Roman Catholic clergy, and to the fascination for the Czech nobles of the feudal system as they saw it in Germany. By the end of the twelfth century Occidental culture in its German form had everywhere penetrated Bohemia and Moravia, and, furthermore, great numbers of Germans had settled throughout both provinces. Their feudal dependence upon the German emperors had begun almost two centuries earlier. During the thirteenth century everything helped on the change. King Wenzel (Václav) I. (1230–53) made his court as German as possible, surrounded himself with German knights and minnesingers, loved tournaments, the chase, and all chivalric amusements. His son, Přemysl Otokar II. (1253–78), continued in the same course; and the political events which came near making him, instead of Rudolph of Hapsburg, the founder of a new line of emperors were very favorable to the diffusion of German ideas. These conditions continued through the whole of the next century. In 1310 the family of the Přemyslids was succeeded by the pure German family of Luxembourg; and the two most notable kings of this line, Karl I. (1346–78), later as German emperor known as Karl IV., and Wenzel IV. (1378–1419), did not conceal the mainly German character of their interests and designs. It was not until the very end of the fourteenth century that the agitation produced by the Hussite controversy led to a distinct national reaction against this prevailing Germanism.

Under these circumstances it is not surprising to find the first considerable manifestations of Czech literary activity closely connected with those literary movements which appear in Germany in the thirteenth and fourteenth centuries, and which, in fact, had their origin still farther west than Germany, i. e. in France. If the Latin chronicle of Kosmas of Prague (d. 1125) and a few other works of the same kind are omitted, there are no monuments of importance in Bohemia or Moravia until the thirteenth century. Then appear works both religious and profane of the determinate mediæval character just described, which extend on through the whole fourteenth century, and even later. The oldest undoubted religious monument is a poem of the thirteenth century, beginning *Slovo do světa stvořené* (*The Word created in the World*). It is a song based on some Latin original, and the precursor of many. About the same time legends began to be written; and there exist, dating back to the thirteenth century, fragments of legends about the *Virgin*, about the *Passion*, the *Apostles*, the *Holy Ghost*; to the fourteenth century, the legend of *Judas and Pilatus*, that of *St. Alexis*, *St. Dorothea*, *St. Catherine*, *St. Procopius*, *Mary Magdalen*, the *Apostle John*, etc. In the time of Karl IV. these and other legends were collected in a *Passional*, which shows the influence of the *Legenda Aurea* of Jacobus de Voragine (*q. v.*). To this period also belong several religious poems of the allegorical and didactic character so dear to the Middle Ages, e. g. an anecdotical interpretation of the *Ten Commandments*, the *Debate of the Soul and the Body*, the *Rich Man*, the *Transitoriness of the World*, etc. At the same time the translation of the various books of the Bible was slowly going on; and finally, in 1410–16, a collection of these translations was made. The Czech Bible was first printed in Prague in 1488. The religious drama, also, had its rise during the fourteenth century. The earliest fragment of it is the curious serio-comic *Mastičkář* (*Ointment-seller*), from the first years of the century. Several other similar pieces are in existence.

In the meantime profane literature was also being written. The *Alexandreïs*, based upon the Latin poem of Gualtherus ab Insulis, probably dates from the second half of the thirteenth century. To the fourteenth century belong the story of *Tristram*, that of *Tandarias and Floribella* (connected with the cycle of the Round Table), and the apparently indigenous romantic tale *Tkadleček*. The fables and apologues, many of them of Oriental origin, that were so eagerly used all over Europe for didactic or satirical purposes, made their way to the Czechs, as to others. The famous Smil of Pardubic, surnamed Flaška (Jan Smil Flaška z Pardubic a z Rychmburka, d. 1403), employed these for his allegorical didactic works, of which two at least have come down to us, the *Nová Rada* (*New Counsel*, 1394–95) and *Proverbia Flasskonis*, one of the earliest collections of proverbs made in Europe. There have been attributed to the same writer, but with little certainty, several other works of a somewhat similar character, e. g. *Rada otce k synu* (*A Father's Advice to his Son*), *Svár vody s vínem* (*The Debate between Water and Wine*), and *Podkoní a žák* (*The Hostler and the Scholar*). An interesting trait in Smil of Pardubic is his dislike of the Germans; and yet there is little that is essentially Czech to be found in his works.

Another side of literature in this period, the learned side, deserves some words. After the beginning of the fourteenth century a series of chronicles in the Czech tongue made its appearance. The most famous of these are the chronicle attributed to Dalimil of Meseritsch, giving the events of Bohemian history down to 1314 from a strongly nationalistic point of view; and that of the priest Pulkava (Přibyslav, or Přibík, Pulkava z Hradenína, d. 1380), a friend of King Karl IV. Besides chronicles, there are not a few works on jurisprudence of a highly interesting character, e. g. *Kniha starého pána z Rozenberka* (*The Book of the Old Lord of Rosenberg*, d. 1347); *Řád práva zemského* (*Law of the Land*, 1348–55); and *Výklad na právo země české* (*Commentary on the Bohemian Common Law*, about 1400), by Andreas of Duba (Ondřej z Dubé, d. 1412). Finally, we must speak of various translations of learned or quasi learned books into Czech, e. g. the *Anticlaudianus* of Alanus ab Insulis, the *Distiches* of Dionysius Cato, the so-called *Martimianus*, the *Elucidarius*, works of Albertus Magnus, the travels of Maundeville and of Marco Polo.

While such were the prevailing tendencies in Czech literature during the thirteenth and fourteenth centuries, there were not lacking signs of the great religious and national reaction that was to make Bohemia in the fifteenth century one of the most notable countries in Europe. During the fourteenth century, especially, there are constantly increasing indications of discontent with the condition of the Church. In this Bohemia was not peculiar; for as early as the twelfth century the poets and wandering scholars of France and Germany and England are found uttering bitter criticisms of monks and priests, and even popes. In the thirteenth century these criticisms had become a constant stream, and issued from nearly every European people. In Bohemia, however, scoffing or reformatory zeal was made more formidable by additional causes: first by a vague national consciousness, and a very distinct dislike of the influence of the Germans; then by reminiscences of the earlier Greek faith that had been the first form of Christianity known to the Czechs, and was still the form held by other Slavic peoples; and finally by a remarkable extension of intellectual activity, due in the main perhaps to the founding of the University of Prague by Karl I. in 1348. The very clergy began to denounce the iniquities of the Church. Konrad Waldhauser (d. 1369), Jan Milič (d. 1374), Matthew of Janov (Matěj z Janova, d. 1394), and especially Thomas Štítný (Toma, or Tomáš, ze Štítného, b. 1325–26; d. about 1405), in their detestation of ecclesiastical vices, tended more and more to make religion consist, not in allegiance to the Church, but in personal truth to God, as indicated by the interpretation of the Bible according to reason. Štítný, moreover, turned directly to the Czech people, rousing patriotic feeling by utterances like his famous, "I shall write in Czech, because I am a Czech, and the Lord God loves a Czech as well as a Latin." Works like his *Knížky šestery o obecných věcech křesťanských* (*Six Books about Common Christian Things*) and his *Knihy naučení křesťanského* (*Books of Christian Teaching*) profoundly stirred the moral and patriotic enthusiasm of his race.

These tendencies, however, were destined to find expression in a man far greater than any of those just mentioned, indeed, one of the greatest in the religious history of Europe, John Huss (Jan Hus). Born in 1369 at Husinec, Huss received his bachelor's degree at Prague in 1393; became Bachelor of Divinity in 1394, and Master of Arts in 1396. He began to teach at once, both in the faculty of arts and in that of divinity. In 1401–02 he was dean of his own faculty, and about the same time became a priest and preached in the Bethlehem chapel. In 1402–03 he was rector of the university. Early sympathizing with the reformatory movement, he was powerfully affected by the writings of Wycliffe, brought from England about 1398 by his friend,

Jerome of Prague (b. about 1379; d. 1416). As the discussion of the Wycliffite doctrines grew heated in the university, Huss endeavored at first to explain them and to show that they were not heretical. But the question was speedily confused by the race jealousies between the four "nations" into which the university was divided; and when it became clear that the Czech "nation" alone sympathized with the new teachings, Huss threw his fortunes in with his countrymen. He was instrumental in persuading Wenzel IV. to give to the Czech "nation" three votes instead of one (Decree of Kuttenberg, 1409), as a consequence of which all the foreign teachers and students, to the number of nearly 5,000, left Prague, going for the most part to Leipzig. In 1409–10 Huss was again rector of the university. The Church, however, did not submit peacefully. On July 16, 1410, Archbishop Zbyňek ordered all of Wycliffe's writings to be burned, and Huss to be exiled. After vain efforts at conciliation on the part of King Wenzel, Huss, by the king's advice, withdrew from Prague in 1412 and lived quietly in the country until 1414, when he went to the Council of Constance, under promise of protection from Wenzel's brother Sigismund. As is well known, this protection availed him nothing, and on July 6, 1415, he was burned as a heretic in Constance.

For two centuries the intellectual life of the Czechs was mainly determined by the events just described. National and religious feeling were alike aroused by the struggle which Huss inspired by his tragic death. Moreover, he had been a prolific writer, both in Latin and in Czech. His Latin *Tractatus de Ecclesia* (1413) was an epoch-making work for all Europe. What he wrote in Czech was of consequence not only because of its religious import, but also because of the great affection and care he displayed for the national idiom itself. Indeed, it may be said that Huss gave final form to the literary language of the Czechs. His *Postilla*, his *Dcerka, O poznání cěsty pravé k spasení* (*Daughter, or on the Knowledge of the True Way of Salvation*), his *Spiritual Songs*, from which the sacred poetry of the Hussites began, and many similar works, have remained models of literary excellence even to this day.

It is impossible here to do more than indicate briefly the course of the Hussite movement, and the literature it gave rise to. It became almost at the start a national and popular movement, including far the greater part of the Czechs. A friend of Huss, also a voluminous writer, Jacob of Mies (Jakoubek ze Stříbra, d. 1429), introduced the double form of the Eucharist, with bread and with wine, whence the Hussites were known as Utraquists. As time went on the more radical Utraquists threw off entirely the authority of the Church, and were called Taborites (from the town of Tabor, where they were strongest). Other sects of a still more revolutionary character, as the Adamites, also formed themselves. The Church, meantime, undertook to root out the heresy by means of crusades. These were victoriously withstood, however, until 1434, when the Taborites were virtually destroyed in the battle of Lipan. Their ruling ideas, nevertheless, lived on, and, as interpreted by the eloquent and able Peter Chelčický (b. 1390; d. 1460), formed the basis of the famous Union of Bohemian Brethren (*Jednota bratří českých*), which took final shape in the years from 1457–67.

Of names and works from this confused time we can mention only the following: John of Příbram (d. 1448), author of *Lives of Taborite Priests* (*Život kněží Táborských*); John Rokycana (Jan z Rokycan, 1397–1471), author of many Latin and Czech polemical works; Ctibor of Cimburg and Tobitschau (1437–94), a learned writer on Czech jurisprudence and author of the famous *Tobitschau Book* (*Kniha Tovačovská*); Viktorin of Všehrd (1460–1520), also a writer on jurisprudence and author of the *Nine Books of Law and Justice, etc., in Bohemia* (*Knihy devatery o právích, etc.*); Peter Chelčický, already mentioned, author of the *Net of Faith* (*Síť víry*), the *Book of Explanation of Sunday Lessons* (*Postille*), and many other extremely popular works.

Contemporary with the agitations of the Hussite movement, a new intellectual impulse began to make itself felt in Bohemia—that of humanism, or the revived study of the classics, which spread from Italy to the rest of Europe in the fifteenth and sixteenth centuries. And in company with humanism came the new art of printing. In 1462 Gregory of Prague (Castulus or Haštalský, d. 1485) gave lectures in the university on Latin authors. In 1468 the first Czech book, the *Trojan Chronicle* (*Kronika trojanská*), was printed. By the beginning of the sixteenth century humanistic studies had become generally diffused among the Czechs. Men like Bohuslav of Lobkovic (1462–1510), Řehoř Hrubý z Jelení (Gelenius, d. 1514), his son Zikmund Hrubý (1497–1554), Mikuláš Konáč of Hodíšťkov (Finitor, d. 1596), and many others, by their grammatical and lexicographical works, their translations from the classics, etc., greatly enlarged the circle of existing ideas. Scientific studies also began, and by the end of the sixteenth century Bohemia was the favorite resort of scholars like Kepler and Tycho Brahe. The indigenous literature obtained a new largeness. Members of the Bohemian Brotherhood, though still essentially Hussite, showed a new range of interest. Thus Jan Blahoslav (1523–71) labored for the education of his race, and superintended the great translation of the Bible from the Hebrew and Greek known as the *Kralitz Bible* (6 vols., 1579–93), which was published at the expense of the Moravian magnate Jan z Žerotína. Poetry, which had suffered somewhat from overmuch of controversy, revived—both sacred and profane. Hynek Poděbrad (1452–92) wrote his *Májový sen* (*May-dream*) and other sentimental or allegorical pieces. Mikuláš Dačický (1555–1626) produced, besides historical works, his *Prostopravda* (a book of songs), etc. Simon Lomnický, of Budeč (b. 1552; d. after 1622), composed religious, didactic, and satiric poems; e. g. *Cupid's Arrow* (*Kupidova střela*), *A Short Guide for a Young Householder* (*Krátké naučení mademu hospodáři*, 1586), etc. The sacred songs of Martin Michalec, of Leitmeritz (1484–1547), Adam Sturm (1530–65), Jan Augusta (1500–72), Martin Zámrský (or Philadelphus, 1550–92) are worth mentioning. A great quantity of Latin verse was written during this period, and the Czech drama was developed.

Among the Czechs the period we have just been considering, from 1526 to 1620, is known as the golden age of their literature. In it culminated the expression of national impulses and experience, as well as of imported culture. And at its very end came two men, whose names are among the greatest we have to mention, Veleslavín and Comenius, in whom appears the best the Czech literary genius has been capable of. Adam Daniel of Veleslavín (1546–99), though not of striking originality, was a man of universal interests. He wrote school-books, scientific works, histories; translated, edited, revised. His chief production, the *Historical Calendar* (*Kalendář historický*, 1578), was influential both for its method and its style.

The greater part of the life of Jan Amos Komenský (Comenius, 1592–1671) was spent in exile outside of Bohemia. He had hardly attained maturity when the battle on the White Hill (Bíla-Hora, Nov. 8, 1620) destroyed the freedom of Bohemia for nearly two centuries. Catholicism was triumphant over reform; and although the Peace of Westphalia (1648), which ended the Thirty Years' war, left the Lutheran Protestants in enjoyment of their faith, it did nothing for the Hussite Bohemians. Utraquists and Brethren were obliged to flee from their homes, settling as "Exulants" wherever they saw hope of safety. The victorious Catholics proceeded to root out, as far as possible, every trace of Hussitism. Czech books were seized and burned wherever found. Even a century later, Antonin Koniáš (1691–1760), the fanatic inquisitor, could boast that he had himself caused 60,000 Czech books to be burned. The very language was held in suspicion, and its use in the schools was prohibited as late as the reign of Maria Theresa. In spite of these terrible sufferings of his fatherland, however, and in spite of his own exile, Comenius was able to win a European fame. His labors were indeed astonishing. By his works on pedagogy he reformed the educational methods of all Europe. Most noted among these are his *Didaktika* (written 1626–32), his *Informatorium*, and especially his *Janua linguarum reserata aurea* (1631), published also in Czech in 1633. His encyclopædic, philosophical, and religious writings were widely admired—as his *Prodromus pansophiæ* (London, 1639); his *Pansophiæ diatyposis* (London, in English of Collier, 1641; Dantzic, in Latin, 1643); his *Centrum securitatis* (*Hlubina bezpečnosti*, etc., 1625), and many others. And, finally, his poem *Labyrint Světa a Ráj srdce, etc.* (*Labyrinth of the World and Paradise of the Heart*, 1623), has remained one of the chief monuments of all Czech literature.

After Comenius, as has been indicated, Czech literature practically came to an end for nearly a hundred and fifty years. In all that time there is not a name worth recording. It seemed as if the very possibility of revival had passed. When the revival at last came, one of the men most responsible for it, Joseph Dobrovský, supposed himself to be working at a task of merely antiquarian or scientific interest.

Bohemia and Moravia were firmly tied to Austria, and the Austrian Catholics took good care to stamp out every indication of Hussite or national feeling among the Czechs. Things might have gone on thus had not French ideas invaded Austria, and had not an emperor (Joseph II., 1780–90) mounted the throne whose sympathies were with Voltaire and Diderot rather than with the Jesuits. The period of inquisitorial annoyances came to a sudden close in Bohemia; and although Joseph had not the least intention of fostering the independent national feeling of the Czechs, he was not inclined to interfere with scientific or historical investigations, even if these did bring about at times unexpected results. Already in the time of Maria Theresa a few enlightened men had been attracted to the study of Czech history and institutions, and some of them had ventured to show a kind of enthusiasm for the Czech tongue. Among these may be mentioned Gelasius Dobner (1719–90), the first critical student of Czech history; Ignaz Born (1742–91), chief among the founders in 1770 of the private scientific society which in 1784 became the Royal Academy of Sciences; and, above all, František Martin Pelzel (in German, Franz M. Pelzel, 1734–1801), whose works upon Bohemian history (e. g. *Nová kronika česká*, 1791–96), and especially his edition of Balbinus's *Apology for the Czech Language* (1775), produced a deep impression. More important than these men, however, was the already-mentioned Abbé Josef Dobrovský (1753–1829), who may be called at once the founder of Slavic philology and the awakener of Bohemia to a new sense of national life. Himself unaware of the scope of his labors, using, like his predecessors, German and Latin in preference to Czech in his own works, he yet for the first time made clear to the Czechs that they had a language that was a noble member of the great Slavic group of languages, and a history that did not lack in glory. His *Lehrgebäude der böhmischen Sprache* (1809) and his *Geschichte der böhmischen Sprache und ältern Literatur* (1819) may fairly be called epoch-making books for Bohemia; while his *Entwurf zu einem allgemeinen Etymologikon der slavischen Sprachen* (1814) and his great *Institutiones linguæ slavicæ dialecti veteris* (Vienna, 1822) have a similar importance for the whole Slavic race.

The studies of which Dobrovský was the chief representative spread with remarkable rapidity. There was soon an enthusiasm for the publication of the monuments of Slavic history and literature. Pelzel, Voigt (1733–87), Ungar (1743–1807), Durich (1738–1802), Procházka (1749–1809) vied with each other in these labors. Moreover, a desire began to be felt to try the new-found native tongue in fresh literary works. A group of poets appeared who, for lack of original material, strove to imitate the sentimental manner of Bürger, Gleim, and especially Gessner. Among these poets the chief were Vojtěch Nejedlý (1772–1844), Šebastian Hněvkovský (1770–1847), and especially Antonín Jaroslav Puchmayer (1769–1820). Attempts at a Czech drama were made, notably by the brothers Karel Ignác Tham (1763–1816) and the somewhat younger Václav Tham (d. 1812). On the whole, however, all these efforts were poor and slight in their results.

The trouble was a twofold one. In the first place, the Czech tongue in its long disuse had lost much of its literary capacity. Its vocabulary, its grammar, even its orthography had become confused and uncertain. Since the golden age of Veleslavín and Comenius, it had steadily declined. It was a hard question whether the true principle for the new writers was a return to this older idiom, or the adoption and adaptation of the language of the present. A vehement controversy broke out upon this point, and, curiously enough, it centered about a matter of apparently the most trivial kind, i. e. whether after the hard sounds *c*, *s*, and *z* there should be written *y*, as in the older time, or *i*, after the analogy of other Slavic languages. The adherents of *y* came to be known as Upsilonists; those of *i* as Iotists. And gradually Upsilonism grew to mean all conservation of the pure older Czech language and traditions, while Ioticism meant innovation. The second, and more serious, trouble, however, was that the impulses we know as Romantic had not yet crystallized in Bohemia any more than in the rest of Europe. It was only after the Napoleonic wars that this happened. The struggle against France was what brought about the permanent revival of national and racial feeling which has been so marked a feature of the life of the nineteenth century. Among the Czechs this feeling took the form of Panslavism, and led to the production of what is most powerful in their more recent literature. Until Panslavism had defined itself, however, the Czech writers had really nothing to say.

In spite of controversies, however, there was a steady advance toward a true national literature. In 1818 was founded in Prague the Bohemian Museum, which has continued to be the center of the intellectual life of the Czechs. In 1827 first appeared in German and Czech the literary organ of this institution (*Časopis Českého Musea*), which the aged Goethe warmly greeted (*Works*, 1840, xxxii., pp. 380–410), and which has continued to appear in Czech to this day. In 1831 the museum established a publishing department (called *Matice*) for Czech books. Moreover, there began to write a number of young men, who, both as Romantic patriots and as scholars, were destined to give Bohemia a really substantial literature.

Czech critics regard the year 1820 as marking a new epoch in their Renaissance. Indeed, the period from 1820 to 1848 may be regarded as in many ways the most fruitful part of the nineteenth century in Bohemia. Men who were at once scholars, patriots, and poets both re-established the language, and dignified it with serious works. First of all, Josef Jungmann (1773–1847), who in his translation of Milton's *Paradise Lost* (*Miltonův Ztracený ráj*, 1811) had boldly undertaken to use an idiom large enough for modern needs, brought out a scientific and yet patriotic *History of Czech Literature* (1825), and a *Czech-German Dictionary* (5 large vols., 1835–39) that made available all the resources of the language. Then Václav Hanka (1791–1861) undertook the publication of a complete edition of the earlier Czech literary monuments (*Starobylá skládánie*, 1817–26), not without suspicion of having himself had a hand in manufacturing some of the most interesting. Pavel Josef Šafařík, or Schafarik (1795–1861), rendered Panslavism inestimable service by his *Geschichte der slavischen Sprache und Literatur nach allen Mundarten* (1826), his *Slavic Antiquities* (*Slovanské Starožitnosti*, 1837), and his *Slavic Ethnography* (*Slovanský Národopis*, 1842). František Palacký (1798–1876), the "Father of Bohemian History," brought out in 1836 the first volume of his *Bohemian History*, first published in German (*Geschichte von Böhmen*), later in Czech, *Dějiny národu českého v Čechách a v Moravě* (Prague, 1848–76). Finally, Jan Kollár (1793–1852), the most original Bohemian poet of the nineteenth century, wrote his *Slávy Dcera* (*Sláva's Daughter*, published first, 1821, under the title *Básně*, *Poems*; then, 1824, under its present name), full of a kind of mystical Panslavism; and František Ladislav Čelakovský (1799–1852) brought out his *Slavic Popular Songs* (*Slovanské národní písně*, 1821), his *Echo of Russian Songs* (*Ohlas písní ruských*, 1829), and his *Echo of Czech Songs* (*Ohlas písní českých*, 1840), which fed in another way the ever-growing Panslavist passion.

Contemporary with these greater names, we have a crowd of others of more or less celebrity in several departments of literature: In poetry, Jan Erazim Wocel (1803–71), Karel Jaromír Erben (1811–70), Milota Zdirad Polák (1788–1856), Boleslav Jablonský (1813–81), Václav Štule (b. 1814), the satirist Jaromír Rubeš (1814–53), and others; in the drama, Jan Nepomuk Štěpánek (1783–1844), Václav Kliment Klicpera (1792–1859), Josef Kajetán Tyl (1808–56), and Jiří Jan Kolár (b. 1813); in fiction, besides several of the writers already named, Jan Jiřich Marek (pseud. Jan z Hvězdy, 1801–53), Karel Sabina (1814–77), Prokop Chocholoušek (1819–64), and Vojtěch Hlínka (pseud. František Pravda, b. 1817).

In general, the writers just named were essentially Romanticists, but in all Europe the fateful year 1848 saw Romanticism discredited both in politics and in literature, and what happened elsewhere happened also in Bohemia. People grew tired of the perpetual talk about patriotism, and writers began to dream of disinterested science and art—science and art for their own sake. What Romanticism remained was of the disenchanted Byronic rather than of the enthusiastic type. The forerunner of this change in Bohemia was Karel Hynek Mácha (1810–36), whose lyrico-epic poem *Máj* (*May*, 1836) has had more influence upon living Czech poets than almost any other work. The tendencies of Mácha next appear in Karel Havlíček (1811–56), whom the Bohemians compare to Heinrich Heine. What is positive in the new poetry is an effort at cosmopolitanism as contrasted with nationalism, at perfection of statement and form as contrasted with romantic vagueness and exaggeration. Such in the main are the qualities of poets like Vítězslav Hálek (1835–74), Adolf Heyduk (b. 1836), Jan Neruda

(b. 1834), Jaroslav Vrchlický (real name Emil Bohuš Frida, b. 1853), Svatopluk Čech (b. 1846), and the poetess Eliška Krásnohorská (really Henrietta Pech, b. 1847), though the latter in an article (*Časopis*, 1877) has sharply criticised her contemporaries in favor of the older Romantic generation. The tendencies of the time, however, are too strong to be resisted. They appear in every department of literature—in the drama, as written by Emanuel Bozděch (b. 1841), Václav Vlček (b. 1839), and František Jeřábek (b. 1836); in the novels of Neruda, Čech, Vlček, Bohumil Havlasa (1852–79), Jan Jakob Arbes (b. 1840), Žofie Podlipská (b. 1833); in the historical writing of Antonín Gindely (b. 1829), Josef Emler (b. 1836), the Moravian Vincenz Brandl (b. 1834); in literary history and philology as conceived by Alois Vojtěch Šembera (1807–82), Josef Jireček (b. 1825; d. Nov. 25, 1888), Václav Nebeský (b. 1818), Martin Hattala (b. 1821), Jan Gebauer (b. 1838), Leopold Geitler (b. 1847), Josef Konstantín Jireček (b. 1854). Though there are, of course, great differences in detail between these numerous writers, and though in many of them traces of a modified Romanticism appear, yet, on the whole, they clearly belong, as has been said, to a period of would-be disinterested art and science.

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A. R. Marsh.

Czech, or **Čech**, Svatopluk: Czech writer; b. at Ostředek, in Bohemia, Feb. 21, 1846. Educated at Leitmeritz and Prague, he early attracted attention by poems published in periodicals and collections of verse. He has become an important personage in the Bohemian literary world, editing various periodicals and reviews—among them the *Lumír* and the *Květy*. He has won distinction as a novelist also. Still he is chiefly remarkable as a poet, being esteemed by his compatriots one of the best living representatives of modern Czech poetry. Among his poems are *The Adamites* (*Adamité*), Prague, 1873; *Dreams* (*Snové*), Prague, 1873; *Poems* (*Básně*), Prague, 1874: *New Collection of Verse* (Prague, 1880); *Songs of the Morning* (1887); *New Songs* (1888). His romantic epic *Dagmar* is regarded by the Czechs as on the whole his *chef d'œuvre*. The following works in prose are worth mentioning: *Stories and Arabesques* (*Povídky, arabesky i humoresky*), 4 vols., Prague, 1878–83; *The Candidate for Immortality* (1884); *Sketches of Travel* (1885); *Reminiscences of the East* (1885): the satiric tales, *M. Brouček's Excursion to the Moon* (1888); and *M. Brouček's Excursion in the Fifteenth Century, etc.* (1889).

A. R. Marsh.

Czechs, cheks: most westerly branch of the Slavonic race; found in Bohemia, Moravia, and Upper Hungary. The total number in the Austrian-Hungarian empire (according to the census of 1890 for Austria and 1880 for Hungary, classifying them by language) was 7,366,000. There are about 60,000 in the Prussian province of Silesia. They are supposed to have migrated from the East into Bohemia about the fifth century. At first divided into numerous small tribes, they finally after centuries established something like a popular and national unity. It seemed at one time as though the national feeling were rapidly dying out under German domination, but within recent years, and with the decline of Austria-Hungary as a Germanic power, there has been a great revival of race enthusiasm among the Czechs. This has led to the formation of what is known as "the young Czech" party, which demands the erection of a kingdom to include Bohemia and Moravia, to be united with the empire as Hungary is. See Austria-Hungary and Bohemia.

Czelakovský, or **Čelakovský**, František Ladislav: Czech poet; b. at Strakonice, Bohemia, Mar. 7, 1799. With Kollár and others he took an eager part in the reawakening of the Czechs to national life and expression. He began to publish as early as 1822 original verses and collections of popular songs. It was not till 1829, however, that his *Echoes of Russian Songs* (*Ohlas písní ruských*) attracted general attention to him. For some years after this he was obliged to live by literary hack-work. In 1835 he was appointed to fill for a time the chair of Czech in the University of Prague. In 1842 he was called as Professor of Slavic Languages and Literatures to Breslau. In 1849 he was recalled to a similar professorship at Prague. In 1840 he had published a second collection of Slavic popular songs, *Echoes of Czech Songs* (*Ohlas písní českých*), and also a poem entitled *Rose with a Hundred Petals* (*Růže stotistá*). D. at Prague, Aug. 5, 1852. In the year of his death appeared his *Philosophy of the Slavic People in its Proverbs* (*Mudrosloví národa slovanského v příslovích*, 1852). This was followed by *Lectures on the Comparative Grammar of the Stavic Languages* (1853); *Lectures on the Beginnings of the History of the Civilization and Literature of the Slavs* (*Čtení o počátcích vzdělanosti a literatury národův stovanských*, 1877); *Czetakovský's Correspondence* (in *Sebrané Listy*), 1865. Very interesting also is his *Correspondence with Bohustava Rajska*, published in the volume called *Years of Awakening* (*Zlet probuzení*) 1872.

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A. R. Marsh.

Czenstochof, chens-to'khof: a town of Polish Russia; on the river Warthe (see map of Russia, ref. 8–A). Here is a monastery founded in 1382, which has a dark-colored picture of the Virgin, visited by multitudes of pilgrims, and reputed to have miraculous power. Pop. 18,567.

Czermak, cher'maăk, Johann Nepomuk: physiologist; b. at Prague, June 17, 1828; became in 1865 Professor of Physiology at Jena. He published, among other works, *The Laryngoscope, and its Practical Value for Physiotogy and Medicine* (1860), and *Information from a Physiological Study* (1864). His collected works were published in 1879. D. Sept. 16, 1873, while professor at Leipzig.

Czernowitz, cher'nō-vits (i. e. black city): capital of the Austrian duchy of Bukovina; on a hill near the river Pruth; about 160 miles S. S. E. of Lemberg (see map of Austria-Hungary, ref. 5–M). It is the seat of a bishop of the Oriental Greek Church, has a Greek theological seminary, a gymnasium, a Realschule, a school of midwifery, a provincial library, a chamber of commerce, and manufactures of clocks, hardware, silverware, etc. Pop. (1891) 57,403, of whom about 16,000 are Jews.

Czerny (cher'nče) **George**, or **Kara George**, Black George: a Servian chief: b. Dec. 21, 1766; originally a peasant. He became in 1806 the leader of the Servians, who had revolted against Turkey. He defeated the Turks, captured Belgrade in Dec., 1806, and liberated Servia, secretly aided by Russia. When Russia, invaded by Napoleon, could no longer support him, Czerny was driven out by the Turks in 1813. Having returned to Servia, he was murdered in July, 1817, at the instance of Milosch Obrenovitch. —His second son, Alexander Karageorgevitch, was Prince of Servia from 1842 to 1858. D. May, 1885.

D

: the fourth letter of the English alphabet.

Form.—Its form is derived through the Roman alphabet from that of Chalcis in Eubœa, which, together with those of Argos, Corinth, Laconia, and to some extent of Bœotia, Thessaly, Arcadia, and Achaia, used the rounded form (D) in distinction from the triangular form (Δ) which appears in the other Greek alphabets, notably in the Ionian, upon which the standard Greek alphabet is based, and in the Phœnician, probably the common source of all.

Name.—The Greek name of the symbol, *detta*, is a mere transference of the old Semitic name, Heb. *daleth*, door (of tent?), chosen because it combined with the initial use of the sound an indication of the shape.

Sound.—The sound which it indicates in English, and most commonly in other languages, is the dental (lingual) voiced explosive, involving either a complete check of voiced breath by a closure of the tip of the tongue with the roof of the mouth near the front upper teeth or a breaking with voiced breath of such a closure; the former in *lad*, the latter in *dog*. The French *d* differs from the English in two ways: First, the articulation is narrower—i. e. a narrower surface both of the tongue and the roof of the mouth is covered in the articulation; and second, the closure in French is made against the teeth (dental) rather than the gums (alveolar). The North German *d* is intermediate between the English and the French. In connection with *r*, as in *drawn*, the English *d* is cerebral—i. e. the tip of the tongue is bent upward, and makes a contact farther back upon the roof of the mouth. Spanish *d* and the *d* of Irish-English is strongly dental or even interdental. The Sanskrit alphabet provides for both a cerebral (*ḍ*) and a dental (*d*). They differed much as *d* in English *drown* from French *d* in *dans*. In Modern Greek δ indicates the interdental voiced spirant—i. e. the *th* in English *then*.

Source.—The main sources of the English sound *d* are: (1) Indo-Eur. *dh* (> Gr. θ: Lat. *f-*, *-d-*, (with *r*) *-b-*, Skr. *dh-*); *door*, Gr. θύρα, Lat. *fores*; *udder*, Skr. *ūdhar*, Gr. οὖθαρ, Lat. *ūber*. (2) Indo-Eur. *-t-*, in contact with voiced sounds when the accent does not immediately precede; *hund-red*, Skr. *çatám*, Gr. ἑκατόν, Lat. *centum*. (3) Teutonic þ, in contact with *l*; gold, Goth. *gulþs*; *needle*, Goth. *neþla*. (4) Special development out of O. Eng. *n*; *kindred* < O. E. *cynrœden*, *thunder* < O. E. *þunor*.

Value as Symbol.—The following are the chief uses of D (d) as a symbol or abbreviation: (1) As a numeral, Roman D = 500, $\overline{\text{D}}$ = 5,000, Greek δ' = 4, ,δ = 4,000. (2) In names, Roman D = *Decimus*, also *Dirus*, *Dominus*, *Deus*. (3) In other Latin abbreviations, D (in degrees) = Doctor; D. D. = *donum*, *dedit*; D. D. D. = *dat*, *donat*, *dedicat*; D. S. = *de suo*; D (in date of letter) = *dabam*; D. M. = *Diis Manibus*; D. O. M. = *Deo optimo maximo*. (4) In music, the second tone of the scale of C. (5) In chemistry, D = *didymium*. (6) In English money reckoning, *d* (£ *s. d.*) = *pence*, *penny*, an abbreviation of Lat. *denarius*. (7) In mathematics, *d* = differentiation, *D* = derivation, δ = variation, Δ = differencing.

BENJ. IDE WHEELER.

Dab (*Limanda limanda*): a small, flat fish belonging to the *Pleuronectidæ* or flounder family. It is common on the more sandy coasts of Great Britain. The rusty dab (*Limanda ferruginea*) is a similar species taken on the New England coast.

Dabaiba (dăă-bī'bă; also written **Dabaybe**, **Davaive**, **Abibe**, etc., probably derived from the appellation of an Indian chief of the region): the name given by early Spanish colonists to a district vaguely located somewhere S. of the Gulf of Uraba; later it was supposed to be W. of the Atrato river. It was reported that it contained a temple lined with gold, where slaves were sacrificed to fierce idols. In 1512 Vasco Nuñez Balboa led a force of 160 men in search of this wonderful temple. They wandered for a long time in the forests and found many tribes of savage Indians, some of whom had houses built in trees, but the search was unsuccessful. About 1515 Pedrarias sent Balboa and Carrillo on another quest for the golden temple of Dabaiba, and they returned after losing half their men by Indian arrows, disease, and starvation. For a long time this temple was a golden bait to the cupidity of the Spaniards, and many vain attempts were made to reach it. Such were the expeditions of Pedro de Heredia about 1536 and of Francisco César in 1538. Some ancient tombs containing large quantities of gold ornaments were discovered in this region, and it has been surmised that the story of the temple originated with them.

HERBERT H. SMITH.

Dabchick: a common name in Great Britain for the little grebe (*Podiceps minor*). See GREBE.

Dabney, ROBERT LEWIS, D. D., LL. D.: Presbyterian divine; b. in Louisa co., Va., Mar. 5, 1820; educated in Hampden Sidney College, the University of Virginia, and Union Theological Seminary, Virginia; graduated 1846. He was a pastor 1847–53; professor in Union Theological Seminary, Virginia, 1853–83; collegiate pastor of college church 1856–74; Professor of Philosophy, State University, Austin, Tex., from 1883. He was a major in the Confederate army, and in 1862 was chief of staff of the Second Corps. He was moderator of the Presbyterian General Assembly (South) in 1870. He published *Memoirs of T. S. Sampson* (Richmond, 1854); *Review of Theodore Ernest* (1859); *Life of Gen. Thomas J. Jackson* (New York, 1867); *Defense of Virginia and the South* (1868); *Sacred Rhetoric* (Richmond, 1867; 3d ed. 1881); *Sensuatistic Phitosophy of the Nineteenth Century Examined* (New York, 1875; 2d ed. 1888); *Theotogy, Dogmatic and Potemic* (Richmond, 1879; 3d ed. 1885); *Collected Discussions* (4 vols., 1891–92). D. in 1898.

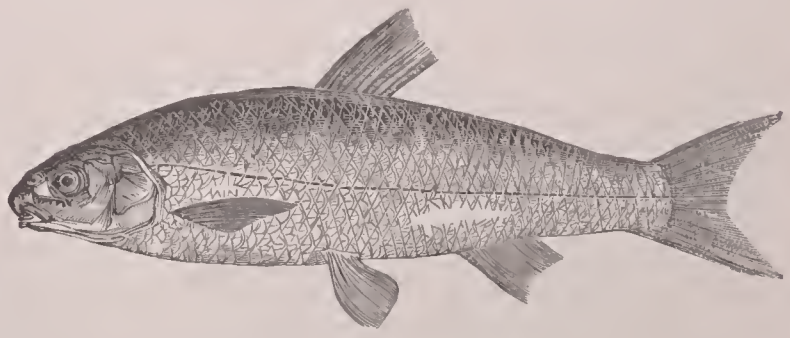
WILLIS J. BEECHER.

Da capo, daa'kaa'pō [Ital., from the beginning; *capo*, head: Fr. *chef* < Vulg. Lat. **capum* for *caput*]: a musical term, abbreviated D. C.; an instruction to the performer in such airs as end with the first strain to return to the beginning and repeat the first part.

Dac'ca: a division of the province of Bengal, British India. Area, 15,000 sq. miles. Pop. about 8,800,000. It is subdivided into five districts, one of which is called Dacca. The district of Dacca forms part of the delta of the Ganges and Brahmaputra. It extends from lat. 23° 12′ to 24° 17′ N., and from lon. 90° 11′ to 90° 58′ E. Area, 2,797 sq. miles. The surface is low and level; the soil is well adapted to the production of rice. Capital, Dacca. Pop. 2,200,000.

Dacca: a city; the capital of the district of Dacca in Bengal; on the Buri'gangá, a navigable stream connected with the Ganges; 127 miles N. E. of Calcutta (see map of North India, ref. 7–J). At the beginning of the nineteenth century it was a thriving and a populous city, but later lost most of its prosperity. Since 1870, however, its trade and manufactures have revived. It contains several ruined palaces, 180 mosques, 119 pagodas or Hindu temples, a government college, several schools, and a large hospital. Dacca has manufactures of fine muslins, cotton cloth, embroidery, pottery, and silver-work. Magnificent ruins of palaces, bridges, etc., are visible here. Pop. (1891) 82,321.

Dace: the *Leuciscus leuciscus*, a small fish of the carp family, common in the streams of Western Europe. It has



Dace.

a stout, round body, covered with good-sized scales. The back is bluish, sides and under parts white, more or less

silvery. It rarely reaches a pound in weight, and is not very good eating, but as it goes in schools, is abundant, and rises to a fly, it is nevertheless popular with local anglers. The dace has numerous relatives in Europe and the U. S., among them the horned dace, *Semotilus corporalis*, of the Middle States. F. A. L.

Dace'lo [transposition of Lat. *alce'do*, kingfisher]: a genus of Australian kingfishers, of which several species have been observed. Of these, the best known is the *Dacelo gigas*, or laughing jackass, a rather large and handsome bird of New South Wales. It takes its popular name from its harsh, dissonant cry, which greatly resembles the so-called laugh of the hyæna, and is not altogether unlike the bray of the ass. This cry is uttered at early dawn. The bird inhabits hollow trees, and feeds upon fish, reptiles, insects, etc.

Dacelo gigas, or laughing jackass.

Dachshund, dăă*k*hs'hoont (Ger. *Dachshund*, badger dog; so-called from being employed in unearthing that animal): a breed of long-bodied, short-legged dogs, with crooked forelegs. The hind quarters should be higher than the fore, the elbow and forefoot should point outward, the wrist inward. The color may be black and tan, dark brown, golden brown, or gray of various shades. Weight, 10 to 28 lb. F. A. Lucas.

Da'ci, also called **Ge'tæ**: an ancient barbarous people who inhabited Dacia. They are supposed to have emigrated from Thrace to Dacia before the time of Alexander the Great.

Da'cia: a former country of Europe; occupied by the Daci, a warlike people. It was bounded on the N. by the Carpathian Mountains, and on the S. by the Danube. The Dacians waged against the Romans a long defensive war which began in 10 B. C., when Augustus sent an army to conquer them. In the reign of Domitian they compelled the Romans to pay tribute. Trajan conquered Dacia, and reduced it to a Roman province in 106 A. D. It was formally relinquished by Hadrian (117–138) on his accession to power, and yet remained under Roman masters till the time of Aurelian (270–275), when the Romans finally withdrew within the Danube, leaving the country to the Goths. This province comprised the eastern part of Hungary, Transylvania, Moldavia, and Wallachia.

Dacier, dăă'si-ā', Anne Lefèvre: classical scholar; b. at Saumur, France, in Mar., 1654. She was instructed in Greek and Latin by her father, the learned Tanneguy Lefèvre, became a resident of Paris in 1672, and was employed by the Duke of Montausier to edit several Latin authors for the use of the dauphin. She was married to André Dacier (1651–1722), librarian of the king, the translator of Plutarch, and editor of the Delphin Horace, etc., in 1683. She published French translations of Anacreon (1681), of Terence, of Homer's *Iliad* (1699), and of the *Odyssey* (1708). As an enthusiastic admirer of Homer and other ancient poets she became engaged in a famous controversy with La Motte, and wrote her *Traité de cause de la corruption du goût*. See Burette, *Éloge de Mme. Dacier*; Rigault, *L'histoire de la querelle des anciens et des modernes* (Paris, 1856), pp. 353–411. D. in Paris, Aug. 17, 1720. Alfred Gudeman.

Da'cite: certain volcanic rocks comprising the quartz-bearing, or most acid members of the andesite series. The term was proposed by von Hauer in 1863 from their occurrence in Southeastern Austria (Roman province of Dacia). They are widespread in many volcanic regions, and were formerly known as quartz-trachytes. See Andesite and Rocks. G. H. Williams.

Dacota, or **Dakota**: See North Dakota and South Dakota.

Dacres, Sir Sydney C.: British admiral; b. at Totnes, Devonshire, England, Jan. 9, 1804; entered the British navy 1817; became captain 1832, rear-admiral 1858, vice-admiral 1865, and admiral 1870; was distinguished as lieutenant in the reduction of the Morea Castle in 1828; as captain in the Crimean war; and as rear-admiral commanded the first ironclad squadron; in 1861, when trouble between Great Britain and the U. S. was imminent on account of the Trent affair, was selected as second in command on the North American and West India station; was senior Lord of the Admiralty 1868–72; governor of Greenwich Hospital 1872–76; in 1874 was placed on the retired list. In 1865 he was created a K. C. B.; was decorated with numerous foreign orders and medals. D. Mar., 1884.

Dactyl [from Gr. δάκτυλος, finger, supposed to be an allusion to the one long and two short joints of the finger]: a metrical foot in Greek and Latin poetry, consisting of a long and two short syllables, as *cārmĭnă*. The term is also applied in the English and in other languages to a foot or measure consisting of one stressed and two unstressed syllables, as *de'sting*. The *light* or *irrational dactyl* has the same representation in syllables, but its value in time is only that of the trochee, so that the three syllables of the one are pronounced in the same time as the two syllables of the other. See Metres.

Dactylology: the science of finger-signs in communicating ideas. See Deaf and Dumb.

Dactylop'terus [from Gr. δάκτυλος, finger + πτερόν, wing]: a genus of spiny-rayed fishes, more correctly known by the earlier name of *Cephalacanthus*, remarkable for its mailed head and for the great development of its pectoral fins. It constitutes a distinct family, *Cephalacanthidæ*. The best-known species is the common flying gurnard, found on both shores of the Atlantic, a brilliantly colored little fish, often seen flying above the surface of the water, and occasionally touching the summits of the highest waves. David S. Jordan.

Flying gurnard.

Dado [Ital., die (plur. dice): Span. *dado*: Fr. *dé* < Lat. *dă'tum*, past ptc. of *dă're*, give; the development of meaning: what is given, result of the throw, the throw, the die]: the cubical portion of a pedestal comprised between its base and cap. Also a broad band of wainscoting, marble, painting, or the like, decorating the lower part of a wall.

Dæd'alus (in Gr. Δαίδαλος): in Greek mythology, an inventor and mechanical genius. He was the reputed inventor of the auger, saw, and other tools. According to tradition, he built the Labyrinth of Crete, and fabricated wings with which he flew from Crete to Sicily. He was the father of Icarus. The inventions ascribed to him are partly artistic, such as the opening of the eyes, which had formerly been closed in statuary, and the extending of the hands, which had formerly been placed down close to the sides; partly mechanical, such as most of the tools employed in carpentry, the mast of the ship, the folding-chair, etc. It seems, however, that when the Greeks ascribed a certain invention to Dædalus they simply meant that it belonged to the period when the arts first sprung up among men.

Dædalus of Sicyon: son and pupil of Patrocles; himself a distinguished artist; flourished about 400 B. C. He made for the Eleans, after their victory over the Lacedæmonians, the trophy which they erected in the grove Altis. Besides this he fashioned statues of several athletes, a Victory, and others enumerated by Pausanias. Henry Drisler.

Daemon: See Demon.

Daffodil [M. Eng. *affodylle*, the prosthetic *d* being probably due to false division in a phrase < O. Fr. *asphodile* < Lat. *aspho'dilus* = Gr. ἀσφοδελός, name of flower]: the name of certain plants of the genus *Narcissus* of the Amaryllis family, particularly of the species *Narcissus pseudo-narcissus* of Europe. The daffodils are among the earliest flowers of spring, and are common everywhere in old gardens. The flowers are yellow, borne singly upon a slender scape a foot high, with a short broad or flaring tube, and a crisped or wavy margin on the cup or corona. Perfectly double forms are also common.

Dagger: a short sword or large knife, the handle of which is usually furnished with a guard and the blade is straight, pointed, and sharpened on two edges. It is carried in a sheath or scabbard. In the sixteenth and seventeenth centuries it was used in connection with the rapier, being held in the left hand to parry the adversary's thrusts. A dagger with a blade from 8 to 16 or more inches long, called a "miserieorde," was carried by the knights of the fourteenth century, and was used to dispatch those who were

overthrown and helpless. A special form of dagger usually called a "dirk" is still carried by the Scotch Highlanders as a part of their equipment. Beside the usual form above described, the blades of daggers have been made of triangular cross section and leaf form, curved, sinuous as the Malay creese, and of many other shapes. JAMES MERCUR.

Daggett, OLIVER ELLSWORTH, D. D.: scholar and divine; son of David Daggett, judge of the Connecticut Supreme Court; b. Jan. 14, 1810, at New Haven, Conn.; graduated at Yale College 1828; studied in the Yale Divinity School 1831–33; ordained pastor of the South church, Hartford, Conn., Apr. 12, 1837; pastor of the First Congregational church, Canandaigua, N. Y., 1845–67; Professor of Divinity in Yale College and pastor of the College church 1867–70; pastor of the Second Congregational church, New London, Conn., 1871–77; resided afterward at Hartford. He was one of the compilers of the *Connecticut Hymn-book*, issued in 1845. D. in Hartford, Conn., Sept. 1, 1880.

Daghestan, dăă-ge-staan′ [Persian *dagh*, mountain + *stan*, country]: a province of Russia; extends along the western coast of the Caspian Sea, from lat. 41° to 43° N., and is mostly between lon. 46° and 50° E. It is bounded S. W. by the Caucasus Mountains, and the surface is generally mountainous. Area, 11,492 sq. miles. Chief town, Derbend. The country belonged to Persia until 1812, when it was ceded to Russia, but the Russian rule was not fully established until the submission of Schamyl in 1859. Pop. (1897) 666,959.

Dagnan-Bouveret, dăăn′yăăn′boo′ve-rā′, PASCAL ADOLPHE JEAN: genre-painter; b. in Paris in 1852. Pupil of Gérôme; second Prix de Rome, 1876; third-class medal, Salon, 1878; first-class 1880; medal of honor 1889; medal of honor, Paris Exposition, 1889; officer Legion of Honor 1892. One of the great artists of the contemporary French school, whose work is admirable technically, fine in color and extremely good in drawing, and wholesome and beautiful in sentiment. He came prominently before the public in 1880 with *The Accident* (collection of W. T. Walters, Baltimore), and followed this success with *The Parental Blessing*, perhaps the finest of all his works (owned in Russia), in 1882, *Vaccination* in 1883, *Le Pain Bénit* (Luxembourg Gallery, Paris) in 1885, *Breton Women at the Pardon* in 1889, and *In the Forest*, 1893. *Horses at the Watering Trough* (1880), an excellent work, is also in the Luxembourg. *The Parental Blessing* is worthy to rank with the best genre-pictures of any school. Dagnan-Bouveret also paints portraits, usually of small size, and his small single figures of Breton peasants are veritable masterpieces. One such is in the collection of Potter Palmer, Chicago. *A Pardon in Brittany* is in the collection of George F. Baker, New York. Studio in Paris.
WILLIAM A. COFFIN.

Dag′obert: the name of several of the Merovingian kings of France.—DAGOBERT I., b. about 602 A. D.; succeeded his father, Clotaire II., in 628. He was one of the most brilliant scions of the Merovingian family. Elected King of Austrasia in 622, he became King of Neustria in 628, after the death of his father, and to these two kingdoms he added that of Aquitaine after the death of his brother, Charibert, in 631. Thus having become sole ruler of the whole Frankish empire, he went to work to curb or restrict the rising power of the double aristocracy of the feudal lords and the prelates. He banished Bishop Arnulph of Metz, and he called Pepin, his "major-domus," to Paris to have him under his immediate control. He ordered a survey to be made of the possessions of all the monasteries, and one-half of the whole mass he confiscated and used for military purposes. One of his greatest feats was his codification of the Frankish laws. Before his death, however, he was compelled to place his son Sigebert on the throne of Austrasia. He died in 638, leaving two sons, Sigebert, King of Austrasia, and Clovis II. of Neustria.

Dagöe, daa′gō-*e*, or **Dago**, daa′gō: an island of Russia; in the Baltic Sea; a part of Esthonia, and separated from the island of Oesel by the narrow Sele-Sund. It is nearly 34 miles long and 15 miles wide. Area, 367 sq. miles. The soil is fertile only along the southern coast. The inhabitants (Esthonian, Swedish, and German) number about 15,000. There are forests upon the island. The exports are fish and cattle of a small and peculiar breed.

Da′gon [from Heb. *dag*, fish]: the national god of the Philistines; human down to the waist, with the tail of a fish; embodying the idea of fertility. Its chief temples were at Gaza (destroyed by Samson, Judg. xvi. 23–30) and at Ashdod, where the idol was miraculously mutilated (1 Sam. v. 2–4), and where the Philistines hung up Saul's head (1 Chron. x. 10).

Daguerre, dăă′ger′, LOUIS JACQUES MANDÉ: the inventor of the daguerreotype; b. at Corneilles, France, in 1789. He became a skillful scene-painter, and was one of the inventors of the diorama. Daguerre and Niepce (1765–1833) began to make experiments in photography conjointly in 1826. After the death of Niepce, Daguerre succeeded in forming indelible images on metallic plates by the chemical action of light, and later improved the process. France pensioned him, and presented his discovery to the world. D. July 12, 1851.

Daguerreotype, dăă-ger′ō-tīp [named from Daguerre, its inventor]: the first successful (now obsolete) form of the photograph. A polished plate of silvered metal was exposed in darkness to the vapor of iodine mixed with bromine, or of iodine alone, until it took a reddish-yellow tint. It was then exposed to the luminous image of the camera and quickly transferred to a dark room. Here the plate (on which no image was visible) was exposed to vapor of mercury, which brought out the figure by blending with that part of the surface which had been affected by the light in the camera. Next the plate was washed in a solution of hyposulphide of soda, which removed the unaltered iodobromide of silver, and left the picture untouched. The principles involved are discussed under PHOTOGRAPHY (*q. v.*).

Dago′ba: a monumental structure containing relics of Buddha or of some Buddhist saint. See PAGODA.

D'Aguesseau, HENRI FRANÇOIS: French jurist. See AGUESSEAU, HENRI FRANÇOIS D'.

Dahl, JOHAN CHRISTIAN CLAUSEN: landscape-painter; b. at Bergen, Norway, Feb. 24, 1778. He early showed decided talent for painting, and studied from 1811 to 1818 at the Academy of Copenhagen. In the latter year he settled in Dresden, where he became professor in the Art Academy and where he spent the rest of his life, making only short excursions to Tyrol, Switzerland, and Italy. His numerous paintings are found in art collections throughout Europe. D. in Dresden, Oct. 14, 1857.

Dahlak Archipelago: a dependency of Italy; in the Red Sea; off the port of Massowa. Area, 420 sq. miles. The largest is the curiously shaped coral island of Dahlak, with a town of the same name. The islands are inhabited by Mohammedans. The pearl-fishery here is important. Pop. 2,000.

Dahlgren, CARL FREDRIK: Swedish poet; b. near Norrköping, June 20, 1791; studied theology and became a preacher in Stockholm, where he died May 2, 1844. His first poems were contributions to a local newspaper. He was associated with Atterbom in *Phosphoros*, and may be regarded as a typical Phosphorist. (See SWEDISH LITERATURE.) In 1829 he gathered his early works into two volumes (*Ungdomskrifter*). His collected writings were edited after his death by A. I. Arvidsson (*Samlade Arbeten*, 5 vols., 1847–52). They comprise poems, lyric and dramatic, comic and romantic tales, and miscellanies. Many of them had first appeared in the poetical annuals, of which he produced several. Dahlgren's lyrical verse has always been popular. His best prose is characterized by luxuriant fancy, which sometimes degenerates into the grotesque, skill in the portrayal of agreeably eccentric characters, warm love of nature, and a delicious playful humor. His faults are the faults of his school. Both his merits and his defects may be seen to good advantage in his comic romance, *Grossörskan Vierdumpels Resa till Kanalfesten år 1832* (Stockholm, 1833). His sketch *Förlofningen* (in *Aftonstjernan: Poetisk Kalender för år 1833*) is an excellent example of his powers in the description of country life.
G. L. KITTREDGE.

Dahlgren, JOHN A.: rear-admiral U. S. navy; b. in Philadelphia, Nov. 13, 1809; entered the navy as a midshipman Feb. 1, 1826. On Apr. 22, 1861, through the abandonment of his trust by Capt. Franklin Buchanan, Dahlgren, then on ordnance duty, became commandant of the U. S. navy-yard, Washington, and to his firmness and sound judgment at that crisis the Government was indebted for the preservation of the yard from falling into the hands of the Confederates. In the fall of 1862 Dahlgren was detached from the navy-yard and appointed chief of the bureau of ordnance, and in June, 1863, became commander-in-chief of the South Atlantic blockading squadron, relieving Rear-Admiral S.

F. Dupont of that command in the harbor of Port Royal, S. C., July 6, 1863. He at once commenced active operations in conjunction with Gen. Gilmore, U. S. army, which speedily resulted in the possession of the greater part of Morris island and the silencing of Fort Sumter, and secured a safe anchorage for the monitors inside the bar of Charleston, thus effectually putting a stop to the blockade-running which had been before so successfully practiced, and reducing Charleston to a place of no importance for the rest of the war. After the fall of Charleston, in 1865, Dahlgren resigned his command, and in 1866 was appointed commander-in-chief of the South Pacific squadron, in the discharge of which duty he remained for two years. In 1868 he was a second time appointed chief of the bureau of ordnance, from which station he was relieved at his own request in 1870, and ordered to the command of the navy-yard at Washington, in which city he died July 12, 1870. He wrote *Exercise and Manœuver for the Boat Howitzer, United States Navy* (1852); *System of Boat Armament, United States Navy* (1852); *Ordnance Memoranda* (1853); *Shells and Shell-guns* (1856); and it is largely to his labors that the navy is indebted for the great improvement in its ordnance since 1840. He invented the DAHLGREN GUN (*q. v.*).

Dahlgren Gun [named from Admiral Dahlgren, its inventor]: an improved form of ordnance used for howitzers, heavy artillery, and especially in naval gunnery. It having been demonstrated that in ordinary cast guns the weight of the metal forward is greater than is needed, and that by far the greatest strain in firing is at the breech, Dahlgren greatly increased the relative size and weight of the breech, with the best results. These guns were chiefly used by the U. S. navy. See ARTILLERY.

Dahlgren, MADELINE VINTON: See the Appendix.

Dah'lia [named after Andrew Dahl, a Swedish botanist]: a genus of plants of the family *Compositæ* and sub-family *Tubuliflorœ*. They are natives of Mexico, and the numerous varieties cultivated are chiefly derived from two species —*Dahlia coccinea* and *Dahlia variabilis*. Dahlias have been very popular, being conspicuous for their varied and exquisite colors and regularity of form, but less attention is paid to them now than formerly, probably. The tuberous roots of these plants, although not agreeable in taste, are used as food in Mexico. A light and moderately rich soil, with plentiful moisture, appears to be best adapted to the cultivation of dahlias.

Dahlmann, daal'maan, FRIEDRICH CHRISTOPH: German historian; b. at Wismar, May 13, 1785. He became in 1813 Professor of History at Kiel, in 1829 Professor of Political Economy in Göttingen, and was deprived of his chair in 1837 on account of his protest against the abolition of the fundamental law by King Ernest Augustus. In 1842 he was appointed Professor of History at Bonn. In 1848 he was one of the leaders of the constitutional party. His chief works are a *History of Denmark* (3 vols., 1840–43); a *History of the English Revolution* (6th ed. 1864); and a *History of the French Revolution* (3d ed. 1864). See *Life* by Springer (1870). D. Dec. 5, 1860.

Dahlone'ga: capital of Lumpkin co., Ga. (for location of county, see map of Georgia, ref. 2–G); on a hill about 66 miles N. N. E. of Atlanta. There are gold mines in the vicinity. Here was before the civil war a branch mint of the U. S.; the building has been converted into the North Georgia Agricultural College. Pop. (1890) 896; (1900) 1,255.

Dahn, JULIUS SOPHUS FELIX: jurist and author; son of the actor Friedrich Dahn; b. Feb. 9, 1834, in Hamburg; Professor of German Jurisprudence in Königsberg 1872, in Breslau since 1888; historical works are *Prokopius von Cäsarea* (1865); *Die Könige der Germanen* (1861–71); *Urgeschichte der german. und roman. Völker* (1881–87); *Geschichte der deutschen Urzeit* (1883–88); poetical works are *Gedichte* (1857); *Harald und Theano* (1856); dramas: *König Roderich*; *Markgraf Rüdeger, Deutsche Treue* (1875); *Sühne* (1879); *Kampfende Herzen, Novellen* (1876); romances: "*Sind Götter?*" (1874); *Ein Kampf um Rom* (1891); *Odhins Trost* (1880); *Kleine Romane aus der Völkerwanderung* (1882–90); *Wettuntergang* (1889); *Odhins Rache* (1891); *Erinnerungen* (1891). C. H. THURBER.

Daho'mey: a French colony (1894) on the Slave coast, West Africa, reaching the Gulf of Guinea at Whydah, but broadening inward and forming a strip between the meridians 130′ E. and 2° 40′ E., which extends northward to about 8° N. lat. It was the hinterland of the French possessions along the coast, and was brought under French dominion as the result of the war with France in 1890–93. Area about 4,000 sq. miles. The surface is generally level, but the northern part is diversified by hills, which are covered with luxuriant forests. The soil is fertile. Maize, cotton, sugar, yams, tobacco, beans, pease, and manioc are cultivated here, and the cocoanut tree and other species of palm flourish. Among the wild animals are lions, tigers, and elephants. The people are fetich-worshipers, their principal fetich being the tiger. The Dahomans are bloodthirsty and cruel, but hospitable and courageous. Human sacrifices and savage religious rites were practiced by them until they were put under the restraint of civilized races. The king, now in exile, was a despot, whose will was law. His wives were numerous, and his chief military officers followed his example. One division of his army consisted of several thousand female warriors. Owing to the peculiar marriage customs of the people and the warfares with other native states, the kingdom, which was once one of the most powerful in Upper Guinea, had become much weakened and reduced. Capital, Abomey. Pop. about 250,000. See Forbes, *Missions to Dahomey* (1851); Burton, *A Mission to Dahomey* (1864); Skertchly, *Dahomey as it Is* (1874); Chaudoin, *Trois Mois de Captivité au Dahomey* (1891).

Daimiel, dī-mĕĕ-āl′: a town of Spain; province of Ciudad Real; 20 miles E. N. E. of the city of Ciudad Real (see map of Spain, ref. 17–F). It has a Gothic church, a town-hall, and a hospital; also manufactures of linen and woolen fabrics and blond lace. Pop. (1887) 11,508.

Daimio, dī'myō′: literally, great name; the title of the feudal barons of Japan before the abolition of the feudal system in 1868–71. These were all vassals of the mikado, but during the Tokugawa shogunate they gradually became subject to the shogun, who compelled them to live in Yedo with their families and a large number of their retainers for at least six months every year, their families being retained as hostages for their good behavior as against the shogun during their absence. When the shogunate was abolished they numbered 255, but their number differed at different times. Each exercised independent authority, and kept in his employment large numbers of samurai or armed retainers, to be placed at the service of the mikado when needed. In 1871 the daimios surrendered their lands and privileges to the mikado, who relieved them of the support of the samurai and granted each a pension proportionate to his former revenue, the highest being 70,000 yen per annum. Some years later these pensions were commuted into interest-bearing bonds, redeemable after five and within thirty years from date of issue. The title has been abolished, and both the feudal or territorial and the kuge or court nobles are styled kwazoku, the samurai being classed as shizoku. The hatamotos or vassals of the shoguns were called shōmio, or "little name." See JAPAN, SHOGUN, and TOKUGAWA. R. L.

Dairy-husbandry: the branch of agriculture which pertains to the breeding, feeding, and management of milch cows, the production of milk, and its conversion into butter, cheese, and the like. Milk has always been an important article of human food, and the making of butter and cheese seems to have been understood and practiced from the remotest periods of history. In earlier times and in some countries, besides the milk of cows, that of asses, goats, and sheep was extensively used; but now the cow is practically the only animal that is kept for its milk. Both in the U. S. and in Europe, dairy operations long formed a part of the household duties of the women of the farm. Under these conditions, while there was wide diversity in the quality of the product, much of it being inferior, certain localities, either because of certain natural advantages or by reason of the skill of the dairy women, became famed for the peculiar qualities of their dairy products. A most striking instance of this is the many characteristic and peculiar varieties of cheese for which France and Switzerland are noted. The introduction of the factory system of manufacture of dairy products marks the era when dairy-husbandry may be said to have become a distinct branch of agriculture. Jesse Williams, of Oneida co., N. Y., established the first cheese-factory in 1860, since which time the principles of modern dairying have been almost wholly developed. Factories for the manufacture of butter soon followed the establishment of cheese-factories, and both rapidly increased in numbers. A primary effect of the factory system was the production of a better and more uniform grade of product: this led to increased consumption, and consequently greatly stimulated

production. Since the introduction of the factory system the two most important influences in the development of the dairy industry have been the invention of the centrifugal machine for the separation of cream from milk, whereby a great economy in the manufacture of butter is secured, and the discovery of methods determining the amount of fat in milk rapidly, easily, cheaply, and accurately, whereby a great aid is given to the selection and improvement of dairy cows. See BUTTER, CHEESE, and MILK. H. H. WING.

Daisy [O. Eng. *dæges ēage*, i. e. day's eye, in allusion to the form of the flower as resembling the sun]: a small perennial plant of the genus *Bellis* and family *Compositæ*. The daisy is a native of Europe, and the species *Bellis perennis* is very common in Great Britain, where its delicate crimson-tipped flower has been immortalized by Burns and other poets. New and very beautiful varieties with variously colored blossoms have been introduced by the florists. Some kinds have the main blossom surrounded by a dozen small flowers formed in the arils of the scales of the involucre. The term daisy is also loosely applied to various composite flowers. The ox-eye daisy, a native of Europe, is *Chrysanthemum leucanthemum*, and is extensively naturalized in the U. S. Revised by L. H. BAILEY.

Dakar: See the Appendix.

Dakoits, or **Dacoits**: armed gangs of robbers who go about in India and Burma plundering travelers and villages. Dakoity, as their practices are called, was formerly very common, but has almost disappeared in British India, owing to active measures of the authorities for its suppression.

Dakota: a former territory of the U. S. See NORTH DAKOTA and SOUTH DAKOTA.

Dakota Formation: in geology, a group of rocks belonging to the American Cretaceous period; first described in territory of the Dakota Indians. Its characteristic beds are of coarse yellowish sandstone, but shales are frequently associated with these. It exhibits a nearly continuous outcrop along the western border of the Great Plains from Texas to Alberta, and appears also at many points in the eastern portion of the plains, being overlaid in the interval by more recent Cretaceous formations. In Texas it rests upon Cretaceous beds of the Comanche series, and in Alberta on the Kootanie formation, also Cretaceous; but in the intervening region it rests in apparent conformity on beds of Jurassic age, as well as unconformably on more ancient formations. West of the plains it reappears in the district of the Colorado plateaus. Fossil shells show that the water body depositing the formation was partly fresh and partly brackish. Abundant remains of plants indicate a luxuriant forest upon its banks. The formation contains a valuable store of coal, and its sandstones constitute the most important reservoir of artesian water in Western North America. The water received along its outcrop at the western or upper edge of the Great Plains has been tapped by the drill at many points further eastward, and affords a series of large fountains, especially valuable in a district sparingly supplied with rain. See CRETACEOUS PERIOD. G. K. G.

Dakota Indians: See SIOUAN INDIANS.

Dakota River, Rivière à Jacques, rĕĕ'vi-ār'ăă-zhăăk', or **James River**: a river of the U. S.; rises in the northeast part of North Dakota. It flows nearly southward, and enters the Missouri river about 8 miles below Yankton. Its whole length is estimated at 600 miles.

Dalberg, daal'bārch, KARL THEODOR ANTON MARIA, von, LL. D.: German statesman and author; b. at Hernsheim, Feb. 8, 1744. He studied law at Göttingen and Heidelberg, entered the Church, and was in 1772 appointed counselor and governor of Erfurt by the Prince-Bishop of Mayence. In this position he revealed an administrative talent of the highest order and supported by nobleness of character and manners. As the friend of Goethe, the Mæcenas of Schiller, the intimate of Joseph II., and author of some spirited pamphlets and essays, he became one of the centers of literary and political life in Germany. In 1802 he was made Archbishop and Elector of Mayence. But Napoleon he could not withstand; alternately threatened and cajoled by him, he became a mere tool in his hands. In 1804 he was present in Paris at the coronation, but even the admonitions of Pius VII. could not prevent him from completely submitting to the dicta of the great conqueror. In 1806 he signed the Confederacy of the Rhine, and was made prince-primate; in 1810 he gave his consent to all the territorial rearrangements which Napoleon demanded, and was made Grand Duke of Frankfort. After the fall of Napoleon his position became untenable; even the many excellent administrative reforms which he had introduced were forgotten or abolished. He made an attempt at explaining his relation to Napoleon, but nobody would listen. He was compelled to resign his sovereignty and retire into private life. D. as archbishop of Regensburg, Feb. 10, 1817. His *Life* was written by B. A. Krämer (Leipzig, 1821) and I. Müller (Würzburg, 1874). See also Beaulieu Marconnay, *Karl von Dalberg und seine Zeit* (Weimar, 1879).

Dalber'gia [named in honor of Nicholas Dalberg, a Swedish botanist]: a genus of trees and shrubs of the family *Leguminosæ*, having pinnate leaves. The fruit is a flat membranous pod containing one to three seeds. All the species are natives of tropical climates, and several of them afford valuable timber. The wood of the sissoo of Bengal, the *Dalbergia sissoo*, is extensively used and highly prized in India. The East Indian rosewood is the timber of *Dalbergia lalifolia*.

D'Albert, EUGENE: musician; b. in Glasgow, Scotland, Apr. 10, 1864; son of Charles d'Albert, an English composer of dance music, of French descent. He received his first musical education from his father. In 1876 he entered the National Training School for Music, of London, gaining a scholarship in competition. Here he studied under Sir Arthur Sullivan, Dr. Stainer, E. Pauer, and E. Prout. He was elected for a Queen's scholarship. He went with Richter to Vienna, where he played at a concert on May 11, 1882. Afterward he became a pupil of Liszt, and has achieved great fame as a pianist. He has written symphonies, overtures, and concertos. D. E. HERVEY.

Dale, JAMES WILKINSON: See the Appendix.

Dale, RICHARD: naval officer; b. near Norfolk, Va., Nov. 6, 1756; entered the merchant service when only twelve years of age, serving until the commencement of the Revolution, when he was made a lieutenant in the marine service of Virginia. He was shortly after captured by an English vessel, and while confined on prison-ship his old companions, who surrounded him, influenced him to take sides with England, and he actually engaged on board a cruiser against his native State; he was wounded at an early day, and during his convalescence realized the error he had committed, and firmly resolved to stand by his own country in the future. He entered the U. S. navy in 1776 as midshipman, was captured in 1777, and confined in prison in London nearly two years, when he made his escape in disguise. He hastened to France, and embarked with Paul Jones, who soon made him a lieutenant of his own ship, and became much attached to him. In the action with the Serapis he greatly distinguished himself, and was wounded. Returning to the U. S. in 1781, he was appointed a lieutenant in the navy, and while serving on the Trumbull he received his third wound, and was captured for the fourth time. In 1794 he was made a captain, and a commodore in 1801. He served in command of a squadron during the Tripolitan war, and on his return to the U. S. resigned in 1802. D. in Philadelphia, Feb. 24, 1826.

Dale, ROBERT WILLIAM, D. D., LL. D.: Congregational divine; b. in London, Dec. 1, 1829; graduated M. A. at the University of London 1853; in that year became colleague pastor with John Angell James in Birmingham, and in 1859 sole pastor. D. Mar. 13, 1895. He delivered the lectures on the Lyman Beecher foundation at the Yale Divinity School in 1877. He was for many years a leader among English Congregationalists, and exerted a wide influence in political as well as ecclesiastical affairs. Among his writings are the *Life and Letters of John Angell James* (London, 1861; 5th ed. 1862); *The Atonement* (1875; 9th ed. 1883); *Lectures on Preaching* (the Yale course, 1877; 6th ed. 1890); *Epistle to the Ephesians, its Doctrine and Ethics* (1882; 6th ed. 1892); *The Living Christ and the Five Gospels* (1890); and *The Fellowship of Christ*, etc. (discourses, 1891). He edited *The English Hymn-book* (1875). He was for a time one of the editors of *The Eclectic Review*, and the editor for seven years of *The Congregationalist*. He was eminent for his versatility and power both as a writer and as a public speaker, whether in the pulpit or in the discussion of political and other topics of public interest. GEORGE P. FISHER.

Dalecar'lia (i. e. the land of the men of the dales), or **Dalarne**: a former province of Sweden, now forming the län or county of Kopparberg. It is famous for its beautiful mountain scenery, its forests of pine, and its mines of

iron and copper. The Dalecarlians are a brave and patriotic people, and as a reward for their fidelity they all have the privilege of taking the hand of the King of Sweden when they meet him. Area, 11,421 sq. miles. Pop. (1890) 197,452.

Dale City: town of Pennsylvania. See MEYERSDALE.

Daleites: a body of Scotch Independents who were Calvinists and followers of David Dale (1739–1806), a benevolent manufacturer, the father-in-law of Robert Owen. The Daleites became affiliated with the Sandemanians for a time, but later were Independents. They never had more than one or two congregations.

D'Alembert, JEAN LE ROND: See ALEMBERT.

Dales, JOHN BLAKELY, D. D., LL. D.: minister of the United Presbyterian Church; b. at Kortright, N. Y., Aug. 6, 1815. He was graduated at Union College, New York, 1835, and at the Associate Reformed Presbyterian Theological Seminary at Newburg, N. Y., 1839. From 1840 till 1893 he was pastor of what is now the Second United Presbyterian church of Philadelphia. During portions of this time he was Professor of Pastoral Theology in the Newburg Seminary (1867–76), and one of the editors of the *Christian Instructor*. He published *Roman Catholicism* (Philadelphia, 1842); *The Dangers and Duties of Young Men* (1851); *Biographical Sketches of Drs. John Mason, John M. Mason, Thomas Clark, and Alexander Proudfit: The Gospel Minister* (1852); *History of the Associate Reformed Church and its Missions*, in the *Church Memorial* (Xenia, 1859); *A Memorial Discourse* (on his fortieth anniversary, Philadelphia, 1880). As secretary of the Board of Foreign Missions of his church, he published its annual reports from 1859 to 1892. D. Aug. 28, 1893. WILLIS J. BEECHER.

Dalhousie, dăăl-hoo'zi: seaport; capital of Restigouche co., New Brunswick; at the mouth of the Restigouche river (see map of Quebec, etc., ref. 2–G). It ships large quantities of salmon, lumber, and lobsters. Pop. 3,000.

Dalhousie, EARLS OF (1633): Barons Ramsay of Dalhousie (1619) and of Kerington (Scotland, 1633), Barons Panmure (United Kingdom, 1831).—FOX MAULE, eleventh earl, was born Apr. 22, 1801. He became a Whig member of Parliament in 1835, and was Secretary at War from July, 1846, to Feb., 1852. In Apr., 1852, he succeeded his father as Lord Panmure. He was Minister of War in the cabinet of Lord Palmerston from 1855 to Feb. 1858. In 1860 he succeeded to the earldom. D. July 1, 1874. His successors, GEORGE, his cousin, twelfth earl (b. Apr. 26, 1806; d. July 20, 1880) and JOHN WILLIAM, thirteenth earl, son of George (b. Jan. 29, 1847; d. Nov. 25, 1887) were in turn succeeded by ARTHUR GEORGE MAULE RAMSAY, fourteenth earl (b. Sept. 4, 1878) the eldest son of John William.

Dalhousie, JAMES ANDREW RAMSAY, Earl and Marquis of: a British statesman; b. near Edinburgh, Apr. 22, 1812; a son of the ninth Earl of Dalhousie. He was returned to Parliament for Haddington by the Conservatives in 1837, and succeeded to the earldom on the death of his father in 1838. In 1845 he was appointed president of the Board of Trade by Sir Robert Peel. He was retained in that office by the Whig Prime Minister who came into power in 1846, and he became Governor-General of India in 1847. His administration was successful, though his somewhat aggressive policy contributed to produce the mutiny of 1857. He annexed Pegu, Oude, the Punjaub, and Berar to the British dominions, and developed the resources of India by canals and other public works. In 1849 he was created Marquis of Dalhousie. He returned to England in 1856, and died, without male issue, Dec. 19, 1860. See Arnold, *History of the Marquis of Dalhousie's Administration of British India* (1863–64).

Dalin, daa'leĕn, OLOF, von: Swedish poet and historian; b. at Winberga, in Holland, Aug. 29, 1708. His weekly paper, *Den svenska Argus* (*The Swedish Argus*), 1733–34, modeled on the *Spectator*, won him popular recognition, and procured him the favor of the Government. In 1737 he was made royal librarian; in 1741 he was commissioned to write a history of Sweden; in 1751 he was ennobled, and shortly before his death, which took place Aug. 12, 1763, he was appointed *hofkansler*. Dalin's elegant prose style, seen to advantage in his *Svea rikes Historia* (*History of Sweden*, to the reign of Carl IX., published 1746–62), had great effect on later Swedish writing. His more serious poetry, composed under the influence of French classicism, has little originality, but is marked by a "correctness" and polish which did much to refine the language and improve versification. In his songs he is simpler and more spontaneous. His tragedy *Brynilda* (1739), his comedy *Den afundsjuke* (*The Envious Man*, 1738), and his epic *Svenska Friheten* (*Swedish Freedom*, 1742) deserve mention. D. in Drottningholm, Aug. 12, 1763. G. L. KITTREDGE.

Dalkeith: a town of Midlothian, Scotland, not far from Edinburgh; has large corn-market, corn-mills, breweries, iron and brass foundries, and tanneries. The chief charm is Dalkeith Palace, the principal seat of the Duke of Buccleuch, built in 1700. It was the temporary residence of Charles I. in 1633, of George IV. in 1822, and of Queen Victoria in 1842. Pop. (1891) 6,952.

Dall, CAROLINE HEALEY: See the Appendix.

Dall, WILLIAM HEALEY: naturalist; son of Caroline (Healey) Dall, reformer and author; b. in Boston, Mass., Aug. 21, 1845; educated in private and public schools in Boston; in 1863 a special pupil of Prof. Louis Agassiz and of Jeffries Wyman and Dr. A. A. Gould; served in Massachusetts militia in riots of July, 1863; held several positions on geological surveys, in 1866 going to Eastern Siberia in charge of the works of the Western Union telegraph expedition for an international line to Europe viâ Bering Strait; has since made several expeditions to Alaska, exploring for the U. S. coast survey; palæontologist to the U. S. geological survey 1884; honorary curator of mollusca in the National Museum; member of many scientific societies at home and abroad; author of numerous scientific papers on brachiopods, mollusks, and the ethnology and general natural history of Alaska, besides *Alaska and its Resources* (1870); *Meteorology and Bibliography of Alaska* (U. S. coast survey, 1879); *Coast Pilot of Alaska* (U. S. coast survey, 1884); *Mollusca of the Southeast Coast of the United States* (U. S. coast survey, 1890); *Reports on the Mollusca of the Blake Expedition* (*Bulletin Museum Comparative Zoölogy, 1880–90*); edited Marquis de Nadaillac's *Prehistoric Man*, with notes.

Dallas: town; on railway; capital of Paulding co., Ga. (for location of county, see map of Georgia, ref. 2–F); 33 miles W. N. W. of Atlanta. Here occurred a battle between Gen. Sherman and Gen. Johnston in May, 1864. Pop. (1880) 169; (1890) 455; (1900) 644.

Dallas: city and railway center (settled in 1841): capital of Dallas co., Tex. (for location of county, see map of Texas, ref. 2–I); on Trinity river, 315 miles N. of Galveston. It has an Episcopal female college, several business colleges, a school of fine arts, a convent and parochial school, merchants' exchange, U. S. court-house, public parks, Texas State fair and Dallas exposition buildings, covering 8 acres, race-course, grain-elevators, planing-mills, Union stock-yards, cotton compresses, 134 manufactories, large and small, cotton mills, 2 meat packing houses, 5 banks, water-works, sewers, suburban electric street railways, asphalt streets, etc. It is the center of extensive wheat and cotton belts. A district 8 miles square, with the court-house as the center, embraces Dallas city proper and five suburbs. Pop. of city (1880) 10,358; (1890) 38,067; (1900) 42,638.
EDITOR OF "NEWS."

Dallas, ALEXANDER JAMES: U. S. statesman; b. in the island of Jamaica, June 21, 1759. He emigrated in 1783 to Philadelphia, where he practiced law, and published in 1790 *Reports of Cases in the Courts of the United States and Pennsylvania* (4 vols.; 3d ed. 1830). In 1801 he was appointed a district attorney of the U. S. He became Secretary of the Treasury in the cabinet of Madison in Oct., 1814, when the national revenue was insufficient and the public credit was impaired. He wrote an able report to Congress recommending the establishment of a national bank, raised money by a loan, and restored the public credit. He resigned office in Nov., 1816. D. in Trenton, N. J., Jan. 16, 1817.

Dallas, GEORGE MIFFLIN, LL. D.: U. S. statesman; a son of Alexander James Dallas; b. in Philadelphia, July 10, 1792. He studied law, and was admitted to the bar in 1813. In 1824 and 1828 he supported Gen. Jackson as a candidate for the office of President. He was elected in 1831 to the Senate of the U. S. for a short term, which expired in Mar., 1833. He was sent as minister to St. Petersburg in 1837, returned in 1839, and was elected Vice-President of the U. S. in 1844, when Mr. Polk was chosen President. In 1846 he gave his casting vote in the Senate for a low tariff bill, in direct violation of his ante-election pledges. In Feb., 1856, he was appointed minister to England, where he remained until 1861. Many of his speeches were published, and a *Series of*

Letters from London appeared after his death. D. in Philadelphia, Dec. 31, 1864.

Dalles of the Columbia: a narrow portion of the Columbia river, 45 miles above the Cascades. The river here rushes violently through a chasm only 58 yards wide, inclosed between steep walls of basaltic rock. *Dalle* is a French word signifying "flag-stone," and also a "spout" for water.

Dalles of the St. Louis, The: a beautiful series of rapids in the St. Louis river, near Duluth, Minn. The river falls 400 feet in 4 miles over a bed of slate.

Dalles, The, or **Dalles City**: city (founded in 1852); capital of Wasco co., Ore. (for location of county, see map of Oregon, ref. 1–E); on Union Pacific R. R., and on the south bank of the Columbia river; 88 miles E. from Portland; has 4 schools, 1 academy, a seminary for girls (Catholic), 7 churches, 1 large flouring-mill, and a machine-shop. The river is obstructed above here by rapids and falls. The Dalles is a great shipping-point for grain, stock, and wool; 5,500,000 lb. of wool are handled here annually. Pop. (1880) 2,232; (1890) 3,029; (1900) 3,542.

EDITOR OF "CHRONICLE."

Dalling, LORD: See BULWER, HENRY LYTTON.

Dallinger, WILLIAM HENRY, LL. D., F. R. S., F. L. S.: scientist; b. at Devonport, England, in 1841; educated privately; entered Wesleyan ministry 1861; minister at Liverpool twelve years, until appointed governor of Wesley College, Sheffield, from which he resigned in 1888 in order to study biology; lecturer at Royal Institution, London; Rede lecturer to University of Cambridge; lecturer at Oxford and on the Gilchrist staff; president of Royal Microscopical Society, 1883. Author of *Minute Forms of Life* (1866); *The Origin of Life* (1878); *Creator and What we may Know of Creation* (1881); and a large number of scientific memoirs and monographs. C. H. THURBER.

Dall' Ongaro, dăl'ōn'gă̆-rō, FRANCESCO: Italian revolutionist and author; b. at Odezzo, near Venice, in 1808; became a priest, but was suspended for his independent preaching. He then renounced the Church, and became a revolutionary journalist in Triest, whence he was expelled in 1847. In 1848 he established a journal at Venice called *Fatti, e non Parole*. He took an active part in the revolutionary movements of that year, and was compelled to leave Italy. He became a contributor to several journals in Paris. In 1859 he returned to Italy, and became Professor of Literature at Florence. He has published tales, dramas, and lyric poems. D. in Naples, Jan. 10, 1873.

Dalma'tia: a portion of the ancient Illyricum, now the southernmost province of Cisleithan Austria; a long, narrow tract bounded on the N. by Croatia, on the N. E. by Herzegovina, and on the S. W. by the Adriatic Sea. It includes a number of islands. Area, 4,940 sq. miles. Pop. (1890) 527,426. With the exception of about 87,000 Greeks and a few Protestants and Jews, the population belongs to the Roman Catholic Church. About 96 per cent. of the population are Slavic and 3 per cent. Italian. The coast is bold and indented with bays, which form good harbors. The surface is diversified with mountains (the Dinaric Alps) of limestone formation, the highest of which, Mt. Orien, rises 6,332 feet above the level of the sea. The soil in some parts is fertile, and produces wheat, oats, potatoes, maize, wine, and olives. Good timber for ship-building is procured on the islands. But only 18 per cent. of the total area is under the plow, 5½ per cent. in vineyards, and 22 per cent. in forests. The climate is warm and healthy, but the country is not well supplied with water. The only streams of importance are the Kerku, the ancient Titius, and the Cettina, the ancient Telurus, both of which rise in the Dinaric Alps. The former of these two streams, which forms the boundary between Croatia and Dalmatia, is famous for the picturesque wildness of its scenery. The chief towns are Zara, Spalato, Ragusa, and Cattaro. Dalmatia was conquered by the Romans in the time of Augustus. In the seventh century it was taken by the Slavonians, who founded in it a kingdom which lasted until 1050. In the Middle Ages it belonged to Hungary. In the fifteenth century it fell under the power of the Venetians, who ceded it to Austria in 1797. In 1805 Napoleon annexed it to the kingdom of Italy, and in 1810 to the kingdom of Illyria. It reverted to Austria in 1814. The district of Cattaro in 1869–70 revolted against Austria, in consequence of changes in their old system of military service. After some concessions to the national pride of the Dalmatians, the revolt was suppressed in the latter year. Revised by C. K. ADAMS.

Dalmat'ica, or **Dalmat'ic** [from real or assumed origin in Dalmatia]: a garment with sleeves, mentioned by Roman authors as in use in the second and third centuries A. D., and named in an edict of Diocetian in the fourth century as worn by both sexes. As an ecclesiastical garment it was afterward adopted by deacons when assisting the priest at the altar. It is still worn by deacons in the Greek and Roman Catholic Churches, though in a different form.

Dalri'ada [a word which appears to have signified the country of the race of Riada, an Irish chieftain]: the ancient name of a region in Ireland now known as the "Route," the northern half of the county of Antrim. Some of the race of Riada are said to have settled in Argyleshire, Scotland, where they founded a petty kingdom called also Dalriada. More than twenty kings of this line in Scotland are mentioned before the Dalriads (or Scots) and the Picts became united under Kenneth McAlpine, who became the first King of Albany. The region S. of the Irish Dalriada was called Dalaradia, probably from another chieftain who governed it.

Dalrymple: See HAILES, LORD, and STAIR, EARLS OF.

Dalrymple, ALEXANDER: hydrographer; younger brother of Lord Hailes; b. at New Hailes, near Edinburgh, July 24, 1737; entered East India Company's service and explored many islands in Eastern Archipelago. He became hydrographer to the East India Company in 1779, and to the Admiralty in 1795. He wrote several geographical works. D. June 19, 1808. His library, very rich in works on geography and natural science, was bought by the Admiralty.

Dalton: city and railway junction; capital of Whitfield co., Ga. (for location of county, see map of Georgia, ref. 1–F); 99 miles N. N. W. of Atlanta and 40 miles S. S. E. of Chattanooga. It was an important strategical position during the last year of the civil war (1861–65); headquarters of Confederate army under Gen. J. E. Johnston in the spring of 1864; several spirited battles occurred near by. Abandoned May 7, at the beginning of Sherman's Atlanta campaign. It has a large trade in cotton, grain, fruit, etc., manufactures of cotton, wood, iron, and leather, and is surrounded by large mineral fields of iron, manganese, and limestone. Pop. (1880) 2,516; (1890) 3,046; (1900) 4,315. EDITOR OF "ARGUS."

Dalton: town: Berkshire co., Mass. (for location of county, see map of Massachusetts, ref. 2–C); on Boston and Albany R. R., 146 miles W. of Boston; has important manufactures of paper, machinery, woolens, and cotton goods. Pop. of township (1880) 2,052; (1890) 2,885; (1900) 3,014.

Dalton, JOHN, F. R. S.: chemist; author of the atomic theory; b. at Eaglesfield, in Cumberland, England, Sept. 6, 1766; son of a Quaker weaver. He taught and gave lectures on physical science, and resided in Manchester. In 1802 he announced his important theory of the constitution of mixed gases. The development of the laws of combining proportions and the atomic theory he explained in the first volume of his *New System of Chemical Philosophy* (3 vols., 1808–27). (See CHEMISTRY.) He wrote a number of scientific treatises, which were inserted in the *Philosophical Transactions*, etc. D. in Manchester, July 27, 1844. See *Life* by Lonsdale (1874).

Dalton, JOHN CALL, M. D., LL. D.: physiologist; b. at Chelmsford, Mass., Feb. 2, 1825; graduated at Harvard 1844; took the degree of M. D. there in 1847. In 1859 he published a *Treatise on Human Physiology*, of which the fourth edition, enlarged, appeared in 1867. Among his other works are *Treatise on Physiology and Hygiene for Schools, Families, and Colleges* (1868); *The Experimental Method of Medicine* (1882); *Topographical Anatomy of the Brain* (1885). He became Professor of Physiology and Hygiene in New York College of Physicians and Surgeons. His original investigations in embryology and other departments of physiology gave him a wide reputation. In 1861–64 he served as surgeon in the U. S. army. D. Feb. 12, 1889.

Dalton-in-Furness: a town of England; in Furness, Lancashire, 18 miles W. N. W. of Lancaster (see map of England, ref. 6–F). Here are iron-works and iron mines. Near Dalton are the ruins of the splendid Furness Abbey, founded in 1127 by Stephen, who was afterward king. Pop. (1891) 13,300.

Daltonism: an inability to distinguish colors; so called because the celebrated John Dalton and his brothers had a

defect in vision, in consequence of which red, blue, and green appeared alike. See COLOR-BLINDNESS.

Daly, CHARLES PATRICK, LL. D.: jurist; b. of Irish parentage in New York city, Oct. 31, 1816; admitted to the bar in 1839; became judge of common pleas in that city in 1845, and was chief judge 1857 to Jan. 1, 1886. He was author of articles in *New American Cyclopædia*, lecturer at Columbia College Law School, published a history of the courts of New York (1855), a memoir of Chancellor Kent, and many papers on banking, law, science, etc. He was, from its foundation, president of the American Geographical and Statistical Society, and was a prominent member of the Ethnological Society. D. Sept. 19, 1899.

Daly, JOHN AUGUSTIN: manager and playwright; b. at Plymouth, N. C., July 20, 1838. His family removed to Norfolk, Va., and after the death of the father came to New York, where Augustin attended the public schools, and was subsequently apprenticed to a house-furnishing firm in Maiden Lane, where he remained until he was about twenty years of age. He began his literary career as dramatic editor of the *Sunday Courier*. He also wrote for the New York *Express*, *Sun*, *Times*, and *Citizen* until 1869. *Under the Gaslight* and *Leah the Forsaken*, the latter an adaptation of Mosenthal's *Deborah*, and *Flash of Lightning* were among his first dramatic ventures. On Aug. 16, 1869, he opened the Fifth Avenue theater in Twenty-fourth Street, the first one so named under his management. It was burnt Jan. 1, 1873. On Dec. 3, 1873, he opened Daly's new Fifth Avenue theater, Twenty-eighth Street and Broadway. In 1878 he abandoned management and went abroad. In 1879 he established Daly's theater in Broadway, New York. Here were produced numerous adaptations from German farces, Shaksperean revivals, plays of Pinero, and standard old comedies. He took the whole of his company to Great Britain, France, and Germany several times, and was the lessee of a theater in London. D. in Paris, June 7, 1899.

Daly, JOSEPH FRANCIS: See the Appendix.

Daly, MALACHY BOWES, Q. C.: lawyer; b. in Marchmont, near Quebec, Feb. 6, 1836: educated at St. Mary's College, Oscott, near Birmingham, England. He represented Halifax in the Dominion Parliament 1878–82, and was appointed lieutenant-governor of Nova Scotia, July 15, 1890.—His father, Sir DOMINIC DALY (b. Feb. 2, 1798; d. Feb. 19, 1868), was for twenty-five years colonial secretary; lieutenant-governor of Tobago and later of Prince Edward Island, and governor-in-chief of South Australia. NEIL MACDONALD.

Daly, THOMAS MAYNE: See the Appendix.

Dam: a bank or mole of earth, or a structure of wood, masonry, or the like, built across a stream of water so as to obstruct its flow and raise its level. Dams are designed for the purpose of creating a reservoir, or of securing a head of water to be converted into power. See RESERVOIR DAM.

Damages: See the Appendix.

Damages, Measure of: in law, a collection of the rules which govern the award of damages in courts of justice. The subject is one which in actual practice runs out into great complexity, and forms the topic of extensive legal treatises. All that can be done in this article is to state a few of the principal rules that are applied by the courts, and to refer the reader to leading text-books and other sources of knowledge for detailed information.

It is necessary in the outset to notice the settled distinction that prevails in the jurisprudence of England and the U. S. between courts of law and equity. (See EQUITY.) It is the principal province of courts of law to award damages as a compensation to an injured party for breach of contract or other invasions of private right. Courts of equity, on the other hand, seek to prevent threatened or apprehended injury, or to compel a party in case of a contract to perform it, instead of causing him to pay damages for its violation. Still, in special cases, the equity courts, as auxiliary to other relief, entertain the matter of damages. It is not necessary in this general survey to consider these special cases, and the residue of the discussion will be confined to the examination of rules concerning damages prevailing in courts of law without referring to special instances recognized in courts of equity. A preliminary remark is that courts of justice do not seek to give an injured party compensation for all the damages that he may, by a strict course of reasoning, be supposed to have sustained. Thus no compensation is given for mental anxiety or suffering, nor is full and adequate indemnity necessarily made for the costs and expenses to which a party is unjustly subjected in the course of a groundless litigation. The courts adopt rules of practical convenience which, while they may not supply the demands of an ideal system of jurisprudence, work out substantial justice. The principal propositions recognized in the law of damages will now be stated in the form of rules.

Rule I. The great general principle governing the law of damages is to give *compensation* for the right violated, and nothing more. If a party to a contract plainly stipulates for a larger sum in case of its breach than compensation, he will not be allowed to recover it. The stipulation will be regarded as a "penalty," and will not be enforced. This is well shown by the case of an ordinary bond for the payment of money. This is so drawn that it would appear that the debtor would forfeit twice the amount of his debt if he did not pay with punctuality on the appointed day. Still, no more can be collected than the actual debt with interest. The great point of inquiry in regard to the fact whether a stipulation is a penalty is whether the amount of damages can be ascertained by a numerical calculation or its equivalent. If so, an agreement to pay more will not be enforced. On the other hand, if the damages are uncertain in amount, and the parties choose to enter into an agreement as to the sum to be paid in case the contract is broken, the courts will not interfere with it.

Rule II. Exemplary or vindictive damages are allowable in certain cases, notwithstanding the general principle that the damages must be compensatory. "Exemplary" or "vindictive" damages mean such as are not in their nature compensatory, but are awarded with a design on the part of the court to punish a wrongdoer. The rule respecting them must be regarded as exceptional in its nature, and founded to a certain extent on theories of public policy. There is a certain class of injuries (mainly wrongs or torts) in which the bad intent of the wrongdoer is allowed to enter as an element in fixing the damages. So the absence of an intent may lead to their reduction, as where the act was accidental or committed by an irresponsible person—e. g. a lunatic. Both of these cases may fall within the rule of compensatory damages, since the presence or absence of an evil intent may increase or diminish the injury sustained. Vindictive damages go still further, having in them no element whatever of compensation, but are strictly punitive. The cases in which such damages, among others, are allowed are aggravated cases of trespass upon property or upon the person, slander, libel, seduction, cases of fraud, etc. The theory adopted, as already suggested, is that over and above all compensatory damages the wrongdoer should be made to pay a sum of money as a punishment for his *quasi* criminal act. This is but a rude and imperfect kind of justice, and not reconcilable with sound principle; for if there is to be an amercement of this kind, reason would dictate that the amount should be paid to the state in the course of some appropriate proceeding, rather than to the injured party. The rule has, however, become too well settled in the practical administration of justice to be shaken. Public convenience is promoted by it, since the law in a number of these cases permits no criminal proceeding, and without the doctrine of vindictive damages the wrongdoer would escape all punishment.

Rule III. In making up an estimate of compensatory damages there are various circumstances to be taken into account, lessening or increasing their amount. Among them are bodily pain caused by a personal wrong. The law distinguishes between bodily pain and mere mental suffering. Damage is assumed to be derived from the former, and not from the latter. In some cases damages enter as an element into the cause of action itself. Some forms of slander are only made actionable by affirmative proof that actual damages of a pecuniary nature have been sustained. Thus a charge of unchastity against a female is not by the common law an actionable slander. It may be made so by proof of consequent loss of employment. So in certain cases of slander actual malice or ill-will on the part of the defendant is proper to be taken into account. The fact that a slander known to be false has been deliberately repeated may be used for the purpose of enhancing the damages in an action simply for the first utterance, as it tends to characterize the intent of the defamer. No damages can be given for the repetition of the slander in that action, since that may be the foundation of a subsequent proceeding, and it would be unjust to award damages twice for the same violation of right.

Rule IV. From a violation of right the law assumes, as

a rule, that damage will follow. If no actual damage is proved, "nominal" damages will be recoverable, such as a farthing or a penny. It has been said by high authority that "every injury imports a damage." It might at first thought be regarded as an idle and foolish thing to bring an action when it must be known in advance, from the circumstances of the case, that only nominal damages are recoverable. Such actions, however, are frequently instituted for the purpose of establishing a right. Thus if inspectors at a public election should willfully and improperly reject a vote, the right to vote might be vindicated by an action for damages, though it may be difficult to say that the elector has sustained any appreciable damage. A judgment in his favor would at least establish his right. So if one should assert a right of way over another's land, the owner might establish the non-existence of the right by bringing an action against the claimant for its exercise, even though the trespass was really nominal. A judgment to this effect might be highly important, since an unmolested exercise of the asserted right for twenty years might give the claimant a way by prescription. (See PRESCRIPTION.) There may perhaps be cases where no possible present or prospective damage would be sustained by an invasion of right, thence called cases of *injuria sine damno* (invasion of a right without damage), and accordingly no recovery even of nominal damages can be had.

Rule V. The damages must not be too remote. This is a rule of great importance, and one in respect to which it is easy for inexperienced persons to err. The damage complained of must have been the natural and reasonable result of the act of the wrongdoer, or, in cases of contract, must have been within the contemplation of the parties. Simple as these statements are, they are found in practice to be quite difficult of application. A wide range of inquiry is open as to the point when the result is natural and reasonable. It is plain that no recovery should be had if the damages are really attributable not to the wrongful act of the defendant, but to some intermediate cause. If A were slightly injured by B, and the medical treatment of the wound thus occasioned were so unskillful as to lead to a dangerous result, the damage is not to be imputed to the act of B, but to the want of skill on the physician's part. On the other hand, if the intermediate act be in no sense a cause, but only an attendant upon the injury, the author of the primary act is liable for all the damage sustained. There is a well-known case in which a squib was unlawfully thrown by one person at another, who warded it off so as to direct it toward a third, and so on until the plaintiff, a remote person in the series, was so injured by it as to lose his eye. It was decided that the true author of the plaintiff's injury was the person who first cast the squib, the intermediate parties not having acted deliberately, but involuntarily and by way of self-defense. There is an important distinction to be observed in certain cases between actions of tort and upon contract. In the former case any one directly or consequentially injured by the act of the wrongdoer may bring his action. In the latter, the plaintiff must be substantially a party to the contract. Thus if a person should lend to another for use a tool or machine which he knew to be dangerous and unfit to be used, and did not give notice of the defect to the borrower, he would be liable to him for resulting damages, but not to a mere stranger who might casually make use of the machine, as he would have no connection with the contract of lending.

One of the most important cases that arises under a contract is whether in an action for its breach profits that might have been realized if it had been fulfilled may be recovered as damages. Sometimes the question concerns the right to a rise of price occurring between the time of the making of the contract and of its fulfillment. At other times it relates to the profits to be gained from the use of an article, such as a steamboat running for hire, or a manufactory. The inquiry is to be solved by determining whether the profits can in a just sense be said to have been within the contemplation of the parties. Thus if a seller had merely contracted to sell a chattel, as, for instance, a steamboat, as a mere article of merchandise, supposing, perhaps, that the purchaser intended himself to sell it again, it could scarcely be claimed that anything more could be recovered for breach of contract than the rise in price of the steamboat. On the other hand, if one contracting to repair such an article for an owner had been informed that it was to be used for a season to carry passengers on a particular line, and that for the use of it a large rent could be obtained, and he failed without cause to perform his contract, it might be just to hold him for loss of *rental value*. It would be necessary to distinguish between profits that are in their nature conjectural and arbitrary, and such a price as that for which the thing in question would rent in the market, since the latter would be reasonably certain. The true line of distinction is between that which is uncertain, fluctuating, and therefore not ascertainable, and that which is capable of being measured and ascertained. The same general line of argument must be adopted as to losses sustained. If a common carrier, to whom had been intrusted by an owner a broken shaft of a mill to have it repaired at a distant point and then returned, should neglect to perform his contract, and the mill should consequently lie idle, loss of rental value could not be charged to the carrier unless when the contract was made he was informed of the relation of the broken shaft to the mill, and thus had the means of knowing the consequences that would naturally result from his want of diligence. Without such information he might suppose himself liable simply for the piece of iron considered as a chattel, and might for that reason fail to exercise the extreme diligence that he would have observed had he known all the facts of the case. Similar questions will arise where one is deprived of his property by wrong. The damages should be the legal, direct, and necessary result of the act. Conjectural profits can no more be recovered than in the case of contract. Thus if one should unlawfully deprive another of the use of a manufactory, compensatory damages (as distinguished from vindictive, already explained) would consist in awarding the rental value to the party injured. In the case of personal injuries, disqualifying a person from labor or diminishing his productive power, the question has arisen whether account can be taken of the personal profits of a business in which the injured party is engaged. This will depend upon the point whether the profits are reasonably certain. Thus it has been decided that the past professional income of a physician can be considered in such a case. The New York court of appeals has recently refused to extend this principle to the past profits of a commercial business (such as importing teas), as being too uncertain. (*Masterton* vs. *Mount Vernon*, 58 New York Reports, 390, 1875.) A good illustration of the general principle is to be found in the case where a sale of goods is made with a warranty of their quality. They turn out to be defective, and loss is sustained. No recovery can be had except for losses directly attributable to the defects within the scope of the warranty. Accordingly, if one should purchase with warranty seeds of grass simply as an article of merchandise, without informing the seller that he intended to sow them in his field, and he should sow them accordingly, and, owing to their want of germinating qualities, should lose the use of his soil for a season, he could only recover the market value of the grass-seed, and not for the loss of the use of the ground. Another conclusion would be reached if the dealer in seeds had been informed that growing seed was wanted for the purchaser's use, to be sown upon his farm. On a like principle, if one should buy a ship's cable under a warranty that it was a good cable, it would appear, notwithstanding a questionable decision to the contrary, that he could not recover for the loss of an anchor which it failed to hold owing to its poor quality, unless he had informed the seller, or that person had reason to know, that it was to be used in and about a ship. It should be added that damages are deemed to be too remote when they are produced or aggravated by the plaintiff's own act or negligence. Under this salutary rule an injured party is not by his own remissness and inattention to allow the damages to become unnecessarily swollen, and then charge them to the wrongdoer. If a trespasser should open the gate to a farm, and the owner become aware of it, the latter should not leave the gate open for cattle to despoil his field, and then hold the trespasser responsible. So, if a servant is hired for a definite period and is wrongfully discharged by his master before the time has elapsed, he is not to lie idle if opportunities to work present themselves and charge his master for an amount equivalent to his wages. He should have accepted an offer to labor in the same business, received such wages as he could obtain, and only have held the master for the deficiency. This rule is one of general application in all branches of business, and dictates that an injured party should use reasonable efforts to confine the damages for a wrongful act within as narrow limits as possible. Damages will also be too remote in a class of cases where the defendant may have set another person in

motion who was the immediate author of the wrong, and yet the loss sustained could not reasonably have been within the defendant's contemplation. Still, if the damages could have been foreseen by the defendant, and were the natural result of his act, the modern view is that he ought to be responsible. It was at one time supposed that if the injured party had an action against the direct author of the wrong, the instigator of it, being more remotely related to the occurrence, was not liable. An illustration of the correct principle will be found in the case where a manager of a theater had induced a singer for a rival theater to break her engagement for the theatrical season. In this case the injured party had an action against the singer for violating her contract, and yet the court, after full discussion, held the manager also liable, as the damage sustained was the natural result of his act. The following may serve as an illustration of a case where no liability would attach: A person defames another, who is a servant, in general conversation. One of the listeners repeats the conversation to the master, who wrongfully discharges the servant, so as to make himself liable to an action. In such a case it is plain that there is no natural connection between the slander and the master's wrongful act. It may be that the slanderer did not even know that the person defamed was a servant, or, if he did, had no expectation that the conversation would be repeated to the master.

Another important question in the law of remoteness is whether the costs of an action growing out of or incident to the claim in respect to which damages are demanded can be recovered. For instance, suppose that A is a surety for B. The latter makes default in payment, and the former is sued, incurs a bill of costs, and finally pays the creditor. Should he be allowed his costs? This will depend upon the point whether his resistance to the action was reasonable or not. Perhaps it was wholly useless and unnecessary. In such a case the costs can not be regarded as derived from the principal's default, but from the surety's own obstinacy or pertinacity. It is a wise course when a surety or other person is sued, who, in case he is made to pay, has a claim over against another, to notify that person to make a defense to the action. If he neglects to attend to this notice, and the party sued acts reasonably and in good faith, he may compel the party notified to repay him such costs and expenses as he was obliged by the rules of law to pay. Even in this case of notification there must have been some reasonable ground of defense, otherwise costs can not be recovered. It has been well said "that no person has a right to inflame his own account against another by incurring additional expense in the unrighteous resistance to an action which he can not defend."

Rule VI. Losses not yet accrued may be included in damages, provided that they are naturally derived from the wrongful act, and do not themselves supply a separate cause of action. If a man were wounded in the skull, and at different times fresh pieces of the skull should come out, he would not have a separate action for each piece, but only one for the whole. Accordingly, whenever he brought his action he should recover damages for the entire injury sustained, both present and prospective. Where an injured party may recover the entire damage in one action, in general he must do so. If he fails to demand the whole amount, the judgment will be a bar to all further proceedings. It is sometimes extremely difficult to determine whether the entire damages can be recovered in one action, and the law upon the subject seems to be in a provisional and unsatisfactory condition. Reference must be made for precise information to the decisions of the courts. The rule now under consideration bears a close relation to the statute of limitations (see LIMITATIONS, STATUTE OF), since, if the damages are all recoverable when the wrongful act is done, that statute will begin to run from the time when the wrong was committed, rather than from the period when substantial loss is actually sustained. Thus if an attorney who was employed to examine a title should do his work in such a negligent manner as to induce his client to pay a price for incumbered land while he only intended to pay for unincumbered, the statute begins to run from the time of the breach of duty, rather than from the foreclosure of the incumbrance.

Rule VII. Interest is frequently to be paid by way of damages. (See INTEREST.) In some cases there is a distinct contract to pay interest; in others, the duty to pay interest has no relation to contract, but it is allowed as a compensation for the detention of property unlawfully withheld, or is imposed upon a wrongdoer as a punishment for his wrongful or fraudulent conduct. It is unnecessary to do more than refer to this topic here as it has been sufficiently considered under the topic of INTEREST.

Rule VIII. An important rule applicable to the subject of pleading must be adverted to. For this purpose a distinction is taken between general and special damages. The former are such as the law implies or presumes to have occurred from the act complained of. Special damages are such as are not necessarily implied by the law, but in the particular case do in fact arise, and are sufficiently proximate to be recognized by the rules of law. In this case the law of pleading requires that such special damages should be set forth in the plaintiff's declaration and as a part of his claim. The particular cases to which this rule applies must be sought in the special treatises upon damages and in works upon pleading. One or two instances may be referred to. In an action for a personal injury damages for an interruption of the plaintiff's occupation must be especially stated. The same remark may be made of a loss of rent in an action for injuries to real estate.

Rule IX. The rules concerning the measure of damages are matters of law, to be decided by the court rather than by the jury. The amount of damages is frequently in the discretion of the jury. This is the case in many actions for wrongs and in personal actions upon contract, such as a breach of promise to marry. Still, over these cases the court exercises a superintending power, and may set aside verdicts for excessive damages, showing, as they frequently do, undue prejudice or passion on the part of the jury. This power is sparingly exercised, and only in extreme cases. In extraordinary cases verdicts may be set aside where the damages are too small. This is mainly the case where no damages are allowed by the jury when some ought to be given.

The cases to which the general rules thus referred to are to be applied are very numerous, and require careful consideration on the part of the courts. Among them may be mentioned actions to recover possession of real property or for wrongful interference with it; actions for the breach of covenants for the conveyance or use of land; also upon bills of exchange or promissory notes, upon policies of insurance, upon the sale of goods, contracts growing out of the carriage of goods, including bills of lading; also between special parties, such as principal and agent or principal and surety. Actions for wrongs involving damages are among others for specific goods wrongfully taken (replevin), for their value (trover), for injuries immediate and direct, to person or property (trespass), for injuries indirect and consequential (trespass on the case). Underlying all these actions will be found the rules already stated. For example, if a principal should bring an action against an agent for violating his instructions in selling merchandise below a fixed price, the measure of damages is the loss sustained, and not the difference between the price received and the instruction price. The former rule supplies complete compensation, since the principal could obtain equivalent goods by means of the sum awarded to him. So, if goods be wrongfully taken or "converted," the general rule of damages is their value at the time of conversion, with interest, though, according to some authorities of inferior weight, a much wider range is allowed, so as to include the highest price down to the time of the trial.

A peculiar rule prevails in most of the U. S., as well as in England, in case of a contract to convey land. In the absence of fraud or of knowledge, or reasonable means of knowledge, on the vendor's part that his title is defective, only nominal damages can be recovered if he fails to make a good title to the property which he has contracted to convey. The principal reason of this rule is that in an ordinary covenant for title in a deed the utmost amount of damages allowed by the law of most of the States is the consideration-money and the interest. If no consideration has been paid, nothing can be recovered, so that rise of price does not enter in as an element in an action upon a covenant for title in a deed. It would not be reasonable that, in a contract to convey, any higher rate of damages should be allowed than would be given in case an actual deed had been delivered and the title had proved defective. The law of damages in real-estate transactions is therefore somewhat anomalous and exceptional, and differs widely from that which prevails in the case of the sale or contract to sell personal property. See the treatises of Sedgwick and Mayne.

T. W. DWIGHT.

Daman: another name for the HYRAX (*q. v*).

Daman, dăă-maan′, or **Damaun**, dăă-mown′ (Port. *Damão*, dăă-mowñ′): a Portuguese district in Western India, E. of the Gulf of Cambay, with a seaport of the same name, in lat. 20° 24′ N., lon. 72° 53′ E. (see map of S. India, ref. 2–C). It is entirely surrounded by British territory. Area, 91 sq. miles. The surrounding country is pleasant and fruitful, but inundated in the wet season. The port has been Portuguese since 1558, and is fortified. Pop. of district, 49,000.

Damanhur, dăă-măăn-hoor′ (anc. *Hermopolis Parva*): a town of Lower Egypt; capital of the province of Bahreh; about 40 miles E. S. E. of Alexandria. It has manufactures of cotton and wool. Pop. 23,353.

Damar, dăă-maar′, **Dhamai**, dăă-mī′, or **Dimar**, dĕĕ-maar′: a town of Arabia, in Yemen; 60 miles S. S. E. of Sana (see map of Persia and Arabia, ref. 10–E). It has a citadel, and is celebrated for its schools and its horses. Pop. 25,000.

Dâmar: See DAMMAR.

Damaraland: the northern part of the German protectorate of Southwest Africa; extending along the coast from the mouth of the Kunene river (lat. 18°) southward to Walfish Bay, and eastward to the meridian of 21° E., except at the northeast angle, where it extends along the northern parallel to the Zambezi river. Area, approximately 200,000 sq. miles. The coast is infertile and desolate, but the inland tracts are richer. It includes Kaokoland and a large part of Ovampoland. All mining and other rights conceded by natives belong to the German West African Society.

The inhabitants form two distinct groups, the Ova-Herero, or Damara of the plains, and the "true Damara," or Damara of the hills. The former, living between 21° and 23° S. lat., number 100,000 (estimated, 1891), and are of pure Bantu stock. Physically they are among the finest races of Africa. Their property consists chiefly of cattle, which supply them with clothing and food. They are warlike and unruly, and prize guns and ammunition almost more than their herds. Their history is one long series of struggles with the hill Damara and Ova-Mbos N. and the Hottentots S. of them. The hill Damara, numbering 35,000 (estimated, 1891), and living at the highest elevation of the Damara plateau, are small and physically inferior, but industrious and devoted chiefly to agriculture. Most of them speak a Hottentot dialect, and ethnologists are not agreed as to their origin. See Galton's *Narrative of an Explorer in Tropical South Africa*; Andersson's *Lake Ngami*; Palgrave's *Report of a Mission to Damaraland and Great Namaqualand in 1876*; Cust's *The Modern Languages of Africa*; and Greswell's *Geography of Africa South of the Zambesi*.

Damasce'nus, JOANNES, also called JOHANNES CHRYSORRHOAS (i. e. streaming with gold), either because of his eloquence simply, or in allusion to his birthplace near the river of that name, the Abana of Scripture, now called the Barada; theologian: b. in Damascus about 680 A. D. His father was in the service of the caliph, and he succeeded him. He was, however, a student of theology, and in 727 wrote the three classical letters in defense of image-worship, and against the edict of Leo the Isaurian. In 730 he retired to the monastery of St. Saba, near Jerusalem, where he devoted his time to the study of philosophy and theology and to the composition of religious works. The principal is *The Fount of Knowledge*, in three parts: I. "Heads of philosophy"; II. "Compendium of heresies"; and III. "An accurate summary of the orthodox faith." The last is the longest and by far the most important part, but it is not so much a well-wrought system of divinity as a digest of the teachings of his predecessors, such as Athanasius, Basil, the Gregories, Chrysostom, and others. He was, indeed, the last of the Greek Fathers, and he is the most authoritative theologian of the Greek Church. As he was the first to employ philosophy in the service of theology, and as, at the same time, he is completely dependent on tradition, he may be considered as a forerunner of scholasticism. D. in the convent of St. Saba, near Jerusalem, between 754 and 787 A. D. He was canonized by the Latin and the Greek Churches. His works are in Migne, *Pat. Gr. XCIV.–XCVI.*; and there is a German translation of part iii. of his *Fount of Knowledge* (Kempner, 1885), and an English one (vol. xiii., *Nicene and Post-Nicene Fathers*, New York). See his *Life*, by Lupton (London, 1882). Revised by S. M. JACKSON.

Damas'cus (in Arab. *Sham el Kebeer* or *es Shereef*, the great or the holy): a celebrated city of Asiatic Turkey, in Syria; situated on a triangular plain at the eastern base of the Anti-Libanus; 58 miles E. S. E. of Beyrut; lat. 33° 27′ N., lon. 36° 25′ E. (see map of Turkey, ref. 7–G). The plain of Damascus, regarded by the Arabs as the fairest of the four earthly paradises, is about 70 miles in circumference, and extremely fertile, irrigated by the river Barada and other streams, and adorned with gardens and orchards. The magnificent appearance of this city from afar has been celebrated by ancient and modern travelers. Numberless cupolas and minarets are seen clustered about the towering mass of the great mosque. Within, the streets are narrow and are badly kept, and many of them have a gloomy and decayed appearance. There are numerous bazaars, where jewelry, gaudy horse-trappings, brilliantly colored shoes, spurious antiques, etc., are sold. The external appearance of the private houses is mean, the walls on the street side being made of mud, but within they display all the Oriental splendor of marble pavements, fountains, fresoed walls, etc. Damascus continues to be Oriental in all its features and characteristics. The city is oval in form, surrounded by a picturesque wall with stately towers and gates, and intersected by the broad street which the Romans called Via Recta. The great mosque, 650 feet in length and 150 in breadth, was built by the Christians in the form of a cross, but has been occupied by the Mussulmans since 705 A. D. Damascus has 248 mosques, many of them with splendid minarets. The huge quadrangular citadel, with massive towers, forms part of the city wall. In 1889 gas and street railways were introduced. Several Protestant denominations have established schools, as well as the London Jews' Society. There are important manufactures of cotton, silk, and woolen fabrics, jewelry, saddlery, ropes, glass, and arms, including imitation "Damascus blades." Large quantities of flour, grain, and fruits, especially apricots, are sent out to Beyrut and other towns in Syria. Damascus has an extensive trade in European manufactures, tobacco, spices, Eastern rugs and carpets, dates, indigo, coffee, sugar, etc., carried on by means of camels and caravans, with Bagdad, Bassorah, Persia, etc. Here is assembled annually a large number of men of different nations, who start on a pilgrimage or Hadj to the Kaaba at Mecca. Three lines of railway from Damascus to the coast have been projected, and that between Damascus and Beyrut has been completed. Damascus was a city in the time of Abraham (see Gen. xiv.), and merits above Rome the title of "the eternal city." During the Hebrew monarchy it was the capital of Syria. It passed afterward successively under the dominion of the Assyrians (740 B. C.), Babylonians (604 B. C.), Persians (540 B. C.), Macedonians (333 B. C.), Romans (65 B. C.), Saracens (634 A. D.), by whom it was made the capital of the caliphate of the Ommyiades (661–750), and it was finally captured by the Turks in 1516. Here the apostle Paul was converted and preached the gospel. Damascus is one of the sacred cities of the Mohammedans, and has long been known for the fanaticism of its inhabitants. In 1860 the Druses entered the city and massacred many Christians. One-fourth of the population, estimated at 180,000, are Christians, chiefly Greeks. The rest are Mohammedans (Turks, Syrians, Arabs, Druses), with a few thousand Jews. See Porter, *Five Years in Damascus*.

Damascus Blades: sword-blades of the highest excellence, formerly made at Damascus in Syria. Since the time of the crusades they have been famous for their beautifully watered and lined appearance, as well as for their exquisite temper, which enabled them, when skillfully handled, to cut, not only bars of iron, but to divide films of gauze floating in the air. It is said that good blades of this kind can be bent into a hoop, and will fly back to their original shape without injury. The secret of their manufacture is unknown, but it is said that the Russians have produced swords which equal the best Damascus blades in beauty and temper.

Damask: certain rich stuffs of silk and linen or silk and wool; first manufactured at Damascus, whence the trade was carried to Venice, Lyons, and Genoa. The cloth was woven with flowers and regular figures, and sometimes gold was introduced. In modern times a fabric often made of worsted or worsted and cotton mixed is called damask, and is used for furniture coverings, curtains, etc. Damask linen tablecloths are said to have been first imported from France into England in 1575. The peculiarity of damask linen or linen damask is that the pattern is white on white, showing only by the play of light on the threads.

Damaskeen'ing [from *Damascus*, where the art was practiced with great success]: the ornamenting of steel or

iron by inlaying with other metals, such as gold or silver. There are several methods of performing it.

Damas'tes: son of Dioxippus, a Greek historian; a native of Sigeum. He is called by Suidas a pupil of Hellanicus, and flourished about 440 B. C. Several works are ascribed to him, as *An Account of Events in Greece*; *On the Ancestors of those who Warred against Troy*, in two books; *A Catalogue of Nations and Cities*; and a treatise *Of Poets and Sophists*. Besides these, he composed a *Periplus*, which is referred to by later geographical writers. Very few fragments remain, collected in Müller's *Fragm. Histor. Grec.*, vol. ii., pp. 64–67.

Dam'asus I.: saint; b. in Spain about 305 A. D.; was elected Bishop of Rome in 366. A rival named Ursinus was at the same time elected by a party, but Damasus was recognized by the Emperor Valentinian. Although elected by the Arian faction, he strenuously opposed Arianism. He employed violent methods, but was a man of learning and taste. We are indebted to his instigation for Jerome's new version of the Latin Bible. He improved the church service by introducing the Psalter. Beside some letters, about forty short poems have been preserved, partly in manuscripts and partly in inscriptions. Most of these are in hexameter, some in elegiacs. Two hymns—one to St. Andrew, the other to St. Agatha—are ascribed to him without sufficient authority. His prosody is very defective, and his cadences frequently rhyme. He is remembered for his care of the relics of the martyrs in the catacombs and in the churches. D. in Rome, Dec., 384, and canonized and his day Dec. 11. His works are in Migne, *Pat. Lat. XIII.* See his *Life* by M. Rade (Freiburg im Br., 1882); cf. A. Couret, *De Damasi carminibus* (Grenoble, 1869).—Damasus II., a German, and probably a Bavarian; Bishop of Brixen; was consecrated pope July 17, 1048, and died Aug. 9 of the same year. See Jaffé, *Regesta Pontificum Romanorum*.

Revised by M. Warren.

Dambulla, dăăm-bool'la: a village of Ceylon; 45 miles N. of Kandy (see map of South India, ref. 8–F). Here is a mass of rock about 550 feet high in which are cave-temples devoted to the worship of Bûddha, and profusely adorned with sculpture and images. Among these is a colossal image of Bûddha, hewn out of the rock. These temples, which are partly artificial, were constructed about 100 B. C.

Dameron, dăă'mā'rŏn', Charles Émile: landscape-painter; b. in Paris; contemporary. Pupil of Pelouse; second-class medal, Salon, 1882; medal Centennial Exhibition, Philadelphia, 1876. His work is sober and forceful. His *Woodman's Cabin—Autumn* is in the Luxembourg Gallery, Paris. Studio in Paris. W. A. C.

Damiani, dăă-mĕĕ-aa'nĕĕ, Pietro, known as St. Peter Damien: an influential Italian prelate: b. at Ravenna in 988 (or 1007) A. D. He was appointed Cardinal-Bishop of Ostia in 1057. He opposed simony and other corrupt practices of the clergy, and was a friend of Pope Gregory VII. He was a voluminous writer, and morally and intellectually one of the first men of his time. He took an active share in the political and religious discussions of that day, lived a very ascetic life, and encouraged the practice of self-flagellation as a meritorious penance for sins committed. He is honored as a doctor of the church. D. in Faenza, Feb. 23, 1072. His works are found in Migne, *Patrologia Latina CXLIV.–CXLV.* They include his *Liber Gomontrianus*, which directly charges the Italian monks with sodomy. See Capecelatro's *Storia di San Pier Damiano e del suo tempo* (2 vols., Florence, 1862); also the lives by F. Neukirch (Göttingen, 1875, unfinished), and J. Kleinermanns (Steyl, 1882). Revised by J. J. Keane.

Da'mianists: a sect originating in the sixth century; the followers of Damianus, a Monophysite Patriarch of Alexandria, who taught that the Trinity are God only in their unity, divinity being divided among them, not that each is God in himself alone. So the godhead of the Father, Son, and Holy Spirit forms one single substance. His adherents were also called Angelites, from their place of meeting in Alexandria, the Angelium.

Damia'nus: a distinguished Sophist and rhetorician of Ephesus, of whom an account is given by his friend Philostratus in his lives of the Sophists. In his youth Damianus had attended the lectures of Adrianus and Ælius Aristides, and he formed himself after the model of these. He taught rhetoric in his native place with great success. He was a man of wealth and great liberality, and erected for his fellow-citizens a beautiful portico. He appears to have left no writings.

Damien de Veuster, dăă'mi-ăăn'de-vös'tā' (Joseph de Veuster), "Father Damien": Roman Catholic missionary, who devoted himself to the lepers of the Hawaiian island of Molokai; b. at Tremeloo, near Louvain, Belgium, Jan. 3, 1840; entered holy orders at the age of nineteen. Having been sent on a mission to Honolulu he learned of the terrible condition of the lepers, in number some 700 or 800, and in 1873 established himself among them. He was physician, magistrate, carpenter, teacher—everything. For twelve years he escaped contagion, but in 1885 the fatal disease seized him. He continued his heroic labors to the last, and died Apr. 15, 1889. C. H. Thurber.

Damiet'ta: a town and river-port of Lower Egypt; on the right bank of the east mouth of the Nile; about 8 miles from the Mediterranean and 110 miles N. by E. from Cairo; lat. 31° 25′ N., lon. 31° 47′ E. (see map of Africa, ref. 2–F). It is irregularly built, but has some good mosques, bazaars, and marble baths. The modern town was founded about 1260 four miles S. of the ancient *Tamiathis*, which in the time of the crusades was a strong fortress of the Saracens. The latter was razed and the river blocked in 1251, so that large vessels have not been able to enter the harbor since. The cloth known as *dimity* was first manufactured in this town, and received from it its name. Pop. (1897) 31,288.

Dam'mar, or **Dâmar** [from Hindustani *dāmar*, resin, pitch]: a resin produced by the dammar pine *Agathis loranthifolia* (formerly called *Dammara orientalis*), one of the curious, broad-leaved evergreen conifers from the Malayan Archipelago. The resin is used for varnishes and in microscopy, and for other purposes. The dammar-pine grows to a great height, and its trunk is often many feet in diameter. Its wood, while valuable for indoor use, is unfit for use where it is exposed to the weather. An allied species is the Kauri pine, *Agathis australis*, of New Zealand, a tree 200 feet in height. Its leaves are linear, about 2 inches long, and from ½ to ¾ of an inch wide. The tall, straight trunks are much valued for masts and spars of ships. This species also yields a resin known as Kauri resin or Kauri gum. A third species, *Agathis vitiensis* of the Fiji islands, yields a valuable resin, and a still more valuable white, durable timber. Other resinous substances are to be found under the name of dammar: thus, Indian dammar is the product of species of *Hopea*, tall trees of the family *Dipterocarpeæ*, while black dammar is obtained from another tree of the genus *Canarium* and family *Burseraceæ*. C. E. B.

Da'mo: daughter of Pythagoras, to whom he left his memoirs (Gr. ὑπομνήματα), with strict injunctions not to allow them to pass out of his family. This injunction she obeyed, though in great poverty and tempted with offers of considerable sums of money. She transmitted them to the care of her daughter Bitale.

Dam'ocles (in Gr. Δαμοκλῆς): a Syracusan parasite and courtier who lived at the court of Dionysius the Elder, and was the subject of an experiment recorded by Cicero. As an antidote to his fond admiration of regal luxury and happiness, the tyrant invited him to a sumptuous banquet, where a sword was suspended by a single hair directly over his head.

Da'mon: a distinguished musician of Athens, celebrated also as a Sophist. Plutarch ascribes to him the invention of one form of the Lydian melody. He taught Pericles music, and was his adviser also in many of his political measures. Plato has spoken highly of the abilities of Damon. Late in life he was banished from Athens, no doubt from the objectionable character of his political opinions.

Da'mon and **Pyth'ias** (or **Phin'tias**): two Syracusans, followers of Pythagoras, noted for the firmness of their friendship. Phintias having been condemned to death by Dionysius I., the tyrant of Syracuse, was at his own request permitted to return to his home to settle his affairs, Damon pledging his own liberty and life for his return. Phintias returned just in time to save Damon from death, and Dionysius, charmed with such fidelity, not only pardoned Phintias, but asked leave to share their friendship.

Damoph'ilus of Bithyn'ia: called by Suidas a philosopher and Sophist; reared by Salvius Julianus, who was consul under Marcus Antoninus. He wrote a number of works, of which Suidas says he found the following in the libraries: *Philobiblus, concerning Books worth Possessing*, and *Concerning the Life of the Ancients*. The notices of Damoph-

ilus are collected by Müller, *Fragm. Hist. Græc.*, vol. iii., p. 656.

Dam'ophon, or **Demophon**: a statuary of Messene, flourished about 370 B. C. He adorned Ægium, Messene, and Megalopolis with his works, which were chiefly statues of Parian marble and of wood. Pausanias mentions among the most important of his works a statue of Lucina, one of Æsculapius, of the Mother of the Gods, of Mercury, and of Venus. He was also employed to repair the Olympian Jupiter of Phidias, the ivory of which had become loosened in many places.

Damoph'yle: one of the large group of Greek lyric female poets who were pupils, companions, and followers of Sappho. She flourished about 610 B. C., and was a Pamphylian by birth, but Pamphylia was largely Greek. Like her mistress Sappho, she instructed other young women. She wrote love-poems, and composed those hymns to Artemis which were sung at Perga. None of her works is now extant, and very few facts with regard to her are known.

Damox'enus: a comic poet of the new Attic comedy, probably reaching back also into the middle period. He is referred to by Athenæus, who with Suidas has preserved the titles of two of his comedies, and has given considerable extracts from one of them. All that remains of his writings has been collected by Meineke, *Fragm. Comic. Græc.*, vol. iv., pp. 529–36.

Dampier, William: freebooter, circumnavigator, and author; b. near Yeovil, Somerset, England, in 1652. He began his seafaring life when ten years old, serving as a common sailor in various voyages. In 1674 he went to Jamaica as assistant manager of a plantation, thence drifted to the logwood-cutters' camps of Campeachy, where for a time he led a wild life. In 1678 he returned to England and married, but presently started off again, leaving his wife; got among his old comrades at Campeachy, and thence joined a party of buccaneers, who, after burning Santa Marta, crossed the isthmus and for two years led the life of pirates on the Pacific coasts, sacking Spanish towns, and capturing vessels. Dampier at length made his way round Cape Horn to the West Indies and Virginia, where, after a year, he joined one Cook, a freebooter, for another voyage. This took him to Sierra Leone, thence to South America, and eventually (1688) across the Pacific to the East Indies. There he was marooned on an island among savages, escaped in a canoe, and, after being nearly drowned in a storm, reached Sumatra; went on trading or pirating expeditions to China, India, etc.; was impressed for a soldier, and, after a few more adventures of a like character, reached England in 1691, twelve years from the time he left it, having meanwhile circumnavigated the globe. About his only possession when he landed was a tattooed islander, whom he proposed to exhibit as an Indian prince, but was soon obliged to sell. Dampier had kept rough notes of his voyages, and in 1697 he published his *Voyage Round the World*, which had an immediate and great success; in 1699 he supplemented it by a second volume on his travels. His writings brought him to the notice of the Government, and he was given command of an expedition (1699), in which he explored the coasts of Brazil, Australia, New Guinea, etc.; was wrecked on his return at Asuncion island, but finally reached England in 1701. In Sept., 1703, he commanded a privateering expedition of two ships to the South Seas, but appears to have accomplished little, and his company was finally broken up. He made his way back to England in 1707, having been a third time round the world. From 1708 to 1711 he was pilot of the Duke privateer, which also made the voyage of circumnavigation, capturing some rich Spanish ships on the way. Dampier died in London, Mar., 1715. Besides his books of travel he wrote a valuable *Discourse on the Winds*, which was long a standard work. Herbert H. Smith.

Dampier Archipelago: a group of islands near the northwest coast of Australia; about lat. 21° S. and lon. 117° E. It comprises Rosemary, Lewis, and other islands. Dampier Island, near the northeast coast of New Guinea, with a volcano over 5,000 feet high, belongs to Germany.

Damps [cognate with Germ. *Dampf*, vapor, smoke]: the noxious exhalations of mines and excavations. The carbureted hydrogen of coal mines is called *fire-damp*, and carbonic acid gas mixed with carbonic oxide is termed *choke-damp*.

Damrosch, dăm'rōsh, Leopold, M. D.: musician; b. in Posen, Prussia, Oct. 22, 1832. While a boy he began to study music, but his parents wished him to be a physician; entered the medical department of the University of Berlin and graduated with high honors, receiving his medical degree, but continued the study of music under Hubert Ries on the violin, and Dehn in composition and counterpoint; practiced medicine till 1854, and in 1855 started on a tour as concert violinist, making everywhere a success. On his return to Posen he was appointed musical director at the Stadt theater, and in 1866 was appointed to a similar post in Breslau. Here he remained till he was called to New York in 1871 to take the leadership of the Arion Society, which he retained till 1884. He established the New York Oratorio Society in 1873, and the Symphony Society in 1878, conducting both till his death. He established the German opera in the Metropolitan Opera-house in New York in the autumn of 1884, but died after a short illness on Feb. 15, 1885. Dr. Damrosch was a fine violinist, an excellent composer, and an able conductor. In 1881 he organized a great music festival in the Seventh Regiment armory, the greatest music festival that had ever been held in New York up to that time. D. E. Hervey.

Damrosch, Walter: musician; son of Dr. Leopold Damrosch; b. in Breslau, Germany, Jan. 30, 1862; accompanied his father to the U. S. in 1871. He was educated in music by his father, whose assistant he was in the New York Oratorio and Symphony Societies. In 1881 he was chosen conductor of the Newark (N. J.) Harmonic Society, and in 1884 organist of Plymouth church, Brooklyn; in 1885 succeeded his father as conductor of the Oratorio and Symphony Societies, and as assistant conductor of the German opera at the Metropolitan Opera-house. On May 17, 1890, he married Miss Margaret Blaine, daughter of Hon. James G. Blaine. He is a good pianist, and has composed a few songs and other smaller works. D. E. Hervey.

Damson [for earlier *dammasin* < M. Eng. *damasyn* < O. Fr. *damaisine* < Lat. *Damasca'num* (sc. *prunum*), i. e. plum of Damascus]: a variety of the common plum. It is a small, oval fruit. In Great Britain it is much used as a confection called *damson cheese*. It is cultivated in the U. S. in several varieties, as Shropshire, Frogmore, and French damsons.

Dam, Tinker's: the wall of dough or chewed bread which a tinker puts around the hole which he is stopping, so as to confine the melted solder to that point. After it is once used it of course loses its value, so that its name is often employed in popular slang as a symbol of utter worthlessness.

Dan [Heb. דָּן]: son of the Hebrew patriarch Jacob and Bilhah, Rachel's maid, and the founder of one of the twelve tribes. Also a part of Palestine occupied by the tribe of Dan, and bounded on the W. by the Mediterranean. It contained seventeen cities, the chief of which was Joppa. Dan (or Laish) was an ancient city in the extreme northern part of the Promised Land, and was laid waste by Benhadad.

Dan: a river of Virginia and North Carolina; rises in the southern part of Virginia, flows in a generally eastward direction, and crosses the boundary between those States five or six times. After a course of about 200 miles it unites with Staunton river at Clarksville, Va. Below this junction the stream is called the Roanoke.

Dana, Charles Anderson: journalist; b. at Hinsdale, N. H., Aug. 8, 1819; studied two years at Harvard College; did not graduate, owing to a disease of the eyes, but afterwards received the degree of A. M. He joined the Brook Farm Association in 1842; edited the *Harbinger*, a journal devoted to the interests of Fourierism; was a contributor to the Boston *Chronotype*; was connected with the New York *Tribune* from 1847–62, when in consequence of a disagreement with Horace Greeley, the editor, arising from Dana's attitude toward the war as revealed in his famous editorial articles *On to Richmond*, he was obliged to resign. He was assistant Secretary of War 1863–64, and afterward edited a new Republican paper in Chicago which was not successful. Returning to New York and participating in the purchase of the New York *Sun*, he was its chief editor from 1868 till his death, near Glen Cove, L. I., Oct. 17, 1897. He edited *The Household Book of Poetry* (1857), and in connection with George Ripley edited *The American Cyclopædia*.

Dana, Charles Louis, M. D.: neurologist; b. at Woodstock, Vt., Mar. 25, 1852; educated at Dartmouth College and New York College of Physicians and Surgeons; has

held the position of Professor of Physiology in the New York Woman's Medical College; Professor of Nervous and Mental Diseases, New York Post-graduate Medical School; Professor of Nervous Diseases in Dartmouth Medical College; president of the Neurological Association; author of *Text-book on Nervous Diseases* (1892), and various monographs. C. H. Thurber.

Dana, Edward Salisbury; mineralogist; b. in New Haven, Conn., Nov. 16, 1849; son of James Dwight Dana (*q. v.*); graduated at Yale College, 1870; assistant Professor of Natural Philosophy at Yale, 1879; Professor of Physics, 1890; associate editor *American Journal of Science*, 1875; member of the National Academy, 1884; member Mineralogical Society of St. Petersburg and Geological Society of London; author of *Text-book of Mineralogy* (1877; rev. ed. 1883); *Text-book of Mechanics* (1881); *Sixth Edition of Mineralogy of James D. Dana* (1892). C. H. Thurber.

Dana, Francis, LL. D.: statesman and jurist; b. at Charlestown, Mass., June 13, 1743; a son of Judge Richard Dana; admitted to the bar, 1767; joined the Sons of Liberty; was chosen a member of council of Massachusetts, at that time the supreme executive power in the State, 1776; delegate to the Congresses of 1777 and 1778. In Nov., 1779, he sailed to Europe as secretary to John Adams, who was sent to negotiate a treaty of peace and commerce with Great Britain; appointed minister to Russia, 1780; appointed a judge of the Supreme Court of Massachusetts, 1785; a delegate to the convention which formed the Constitution of the U. S., but his judicial duties and ill-health prevented his attendance; voted for the Constitution as a member of the State Convention convened to ratify it in 1788; chief justice of Massachusetts 1791–1806. In politics he was a Federalist. D. Apr. 25, 1811. He was the father of the poet Richard H. Dana.

Dana, James, D. D.: Congregational theologian; b. in Cambridge, Mass., May 11, 1735; graduated at Harvard in 1753, and was pastor of the First church in New Haven, Conn., 1789–1805. He published an *Examination of Edwards on the Will* (anonymous, Boston, 1770), and *An Examination of the Same Continued* (New Haven, 1773), in both of which he strongly opposed the doctrine of necessity. He received his degree of D. D. from the University of Edinburgh, 1768. A memorable controversy was caused in the denomination by his settlement in his first charge at Wallingford, Conn. (1758–89), as his liberal principles gave great offense to the consociation, but his patriotism during the Revolution did much to allay prejudice. D. in New Haven, Conn., Aug. 18, 1812.

Dana, James Dwight, Ph. D., LL. D.: mineralogist; b. in Utica, N. Y., Feb. 12, 1813; graduated at Yale College in 1833; was appointed instructor of mathematics to midshipmen in the U. S. navy and sailed to the Mediterranean, returning in 1835; from 1836 to 1838 assistant in chemistry to Prof. Silliman at Yale. He published a *System of Mineralogy* (1837; 5th ed. 1868). In 1838 he became mineralogist, geologist, and zoölogist of the Government exploring expedition under Capt. Charles Wilkes which visited the Southern and Pacific Oceans. The expedition returned in 1842, and Mr. Dana was occupied for several years at Washington and New Haven in preparing for publication reports on the results of the explorations. Among these were *Report on Zoöphytes* (with atlas, 1846); *Report on the Geology of the Pacific* (with atlas, 1849); *Report on Crustacea* (with atlas, 1852–54). The first-named report described 230 new species and the third 658, and nearly all the drawings in the atlases were made by Mr. Dana. In 1855, soon after Prof. Silliman's retirement from active duties, Mr. Dana became Silliman Professor of Natural History and Geology; in 1864 the title of the professorship was changed to that of geology and mineralogy. He retained the chair until May, 1894, when he was elected professor emeritus. About 1850 Prof. Dana became associate editor of the *American Journal of Science and Arts*, which his father-in-law, Prof. Silliman, had founded in 1819, and about 1863 became its senior editor. In 1854 he was elected president of the American Association for the Advancement of Science. In 1872 he received the Wollaston medal from the Geological Society of London, and in 1877 the Copley gold medal from the Royal Society of London. He received the degree of Ph. D. from the University of Munich and that of LL. D. from Harvard University, and is a member of many foreign scientific societies. His principal works in book-form not mentioned above are *Manual of Mineralogy* (New Haven, 1848; 4th ed. New York, 1886); *Coral Reefs and Islands* (New York, 1853); *Manual of Geology* (Philadelphia, 1863; 3d ed. New York, 1880); *Text-book of Geology* (1864; 4th ed. 1883). D. in New Haven, Conn., Apr. 14, 1895.

Dana, Napoleon Jackson Tecumseh: U. S. military officer; b. in Eastport, Me., Apr. 15, 1822; graduated at West Point in 1842, and May 29, 1862, major-general U. S. volunteers; served chiefly at frontier posts (1842–45); in the military occupation of Texas 1845; in the war with Mexico 1846–47, and on quartermaster duty 1848–55. He was a banker at St. Paul, Minn., till the beginning of the civil war, when he became colonel First Minnesota Volunteers, and served throughout the war, rising to the rank of major-general and filling many important stations with distinction. Resigned May 25, 1865, and engaged in mining operations in California and as superintendent, president, etc., of several railroads in Missouri, Illinois, and Montana 1878–85. Revised by J. Mercur.

Dana, Richard Henry: author; b. in Cambridge, Mass., Aug. 15, 1787; son of Chief Justice Francis Dana; educated at Harvard College; studied law, and was admitted to the bar of Boston in 1811. He was one of the editors of the *North American Review* in 1818 and 1819. His first volume of verse, containing his best-known poem, *The Buccaneer*, was published in 1827. He published in 1833 a collection of his poems and prose works, including some essays which originally appeared under the title of *The Idle Man*, in 1821–22. D. in Boston, Feb. 2, 1879.

Dana, Richard Henry, Jr., LL. D.: lawyer and author; b. in Cambridge, Aug. 1, 1815; entered Harvard College in 1832, but in 1834 suspended his studies on account of the weakness of his eyes. He then made as a common sailor a voyage to California, of which he wrote an interesting and popular narrative entitled *Two Years Before the Mast* (1840). Having graduated at Harvard in 1839, he studied law under Judge Story and was admitted to the bar in 1840. He published in 1841 *The Seaman's Friend, containing a Treatise on Practical Seamanship*, and also an edition of Wheaton's *International Law* in 1866; was one of the founders of the Free-soil party in 1848, and an orator of the Republican party in 1856. In 1876 he was nominated minister to England by President Grant, but the nomination was rejected, chiefly on account of opposition made by Gen. Butler. D. in Rome, Italy, Jan. 7, 1882.

Dana, William Parsons: marine and figure painter; b. in Boston, Feb. 18, 1833. Pupil of Picot and Le Poitevin, Paris; third-class medal, Paris Exposition, 1878; National Academician 1863. His *Chase of the Frigate Constitution* is in the collection of Mrs. William Astor, New York. Studio in Paris. W. A. C.

Dan'aë (in Gr. Δανάη): in classical mythology, a daughter of Acrisius, King of Argos, who confined her in a brazen tower because an oracle had predicted that her son would kill her father. She became the mother of Perseus, whose father, Zeus or Jupiter, is said to have obtained access to her in the form of a golden shower.

Danæus, or **Daneau**, Lambert: Calvinistic divine; b. at Beaugency, France, in 1530. He studied first law at Orleans, afterward theology at Geneva, and became pastor of Chien; but was compelled to leave his charge in 1563. After the massacre of the night of St. Bartholomew (1572) he fled from France. For several years he was pastor in Geneva, and afterward pastor and professor at Castres. He was a very prolific writer on various subjects, exegetical, doctrinal, ethical, etc. His *Commentary on the Minor Prophets* was translated into English by Stockwood (London, 1594). A complete list of his works is found in *La France Protestante*, iv., 194. In the history of ethics he has a prominent place, as he was one of the first who treated Christian ethics separately from dogmatics. Down to his time and, indeed, for a long period thereafter, ethics were not treated as a distinct part of the theological system, but simply as the practical side of dogmatics, the practical application of the dogma. D. at Castres, in Navarre, 1595.

Dan'aïd: an ingenious hydraulic machine, consisting essentially of two hollow cylinders, placed one within the other, with a comparatively narrow space between; the inner cylinder closed at bottom, the outer having an aperture at the bottom in the center. Between the two bottoms are partitions radiating from the center to the circumference, but the annular cylindrical space is without partitions. The whole is sustained by a vertical axis, about which it

turns easily. A jet or stream of water being now admitted into the annular space, as nearly tangential horizontally to the cylindrical surface as possible, sets the machine in motion, at first by mere friction, but presently the living force imparted to the water by revolution, acting on the radial partitions of the base, accelerates the velocity and increases the force. Experiments show that this machine utilizes from 70 to 75 per cent. of the power due to the hydraulic head. The name seems to have been suggested by the fable of the DANAÏDES (*q. v.*) pouring water forever into a vessel, from which it continually escapes.

Dana'ïdes (in Gr. *Δαναΐδες*): the fifty daughters of DANAUS (*q. v.*), a mythical King of Egypt, who were married to fifty sons of Ægyptus, their uncle. By order of their father, who had been warned by an oracle that he would be slain by one of his sons-in-law, each of the Danaïdes, except one, Hypermnestra, killed her bridegroom on the wedding-night. Polyxena, another of the sisters, killed Ægyptus, as well as his son, her husband. The Danaïdes were doomed in Tartarus to pour water forever into a vessel perforated with holes.

Danakil, dăă-năă-keel' (sing. *Dankali*): an Abyssinian tribe occupying the area bounded N. E. by the Red Sea and S. W. by a range of mountains. It is about 250 miles long. The climate is very hot; the soil is arid and poor. The inhabitants are ferocious, treacherous, and fanatical Mohammedans. They number about 70,000, and now form a part of the Italian colony of Eritrea.

Dan'aus: in Greek mythology, the son of Belus, King of Egypt, who by some is supposed to be Neptune (Poseidon), and twin-brother of Ægyptus. After the death of Belus, Danaus and Ægyptus ruled over Egypt, but, in consequence of a difference between them, Danaus set sail with his fifty daughters to find a new home. He settled in Argos, whose king, Gelanor, he succeeded in dethroning, and established the dynasty of the Belides. Ægyptus, jealous of his brother's prosperity, followed him to Argos with his fifty sons, who under pretense of friendship sought the hands of their cousins in marriage. (See DANAIDES.) Danaus is said to have died about 1425 B. C., and, according to Pausanias, a monument to his memory was to be seen at Argos.

Danbury: city and railway junction; one of the capitals of Fairfield co., Conn. (for location of county, see map of Connecticut, ref. 11–D); 65 miles N. N. E. of New York. The manufacture of hats, which was established here in 1780, employs twenty-six large factories, and the production of boots, shoes, shirts, and boxes is considerable. It has also a foundry, extensive water-works, public library and a hospital. It was settled in 1684, and burned by the British in Apr., 1777. The losses of private property amounted to about $80,000. Pop. of township (1880) 11,666; (1890) 19,473; (1900) 19,474; of city (1890) 16,552; (1900) 16,537.

Danby, FRANCIS, A. R. A.: landscape-painter; b. near Wexford, Ireland, Nov. 16, 1793. His works are marked by fine light-effects. Among his works are a *Sunset at Sea after a Storm* (1824); *Christ Walking on the Sea* (1827); *The Embarkation of Cleopatra on the Cydnus* (1827); and *Caius Marius among the Ruins of Carthage* (1848). Eleven years of his life were spent on the Continent. D. Feb. 9, 1861.

Danby, THOMAS OSBORNE, Earl of: Marquis of Caermarthen and Duke of Leeds; an English Tory statesman; b. 1631; gained the favor of Charles II.; became lord treasurer 1673, and Earl of Danby 1674; was at heart opposed to the king's policy toward France, but was forced to acquiesce to retain his honors. Though he succeeded in bringing about the marriage of Mary to the Prince of Orange, his supposed intrigue for a secret alliance with France caused his impeachment on the charge of treason (1678), and he was confined in the Tower five years. In 1689 he was appointed president of the council by William III., and in 1694 was created Duke of Leeds. D. July 26, 1712.

Dance of Death (in Mediæval Lat. *chorea Machabæorum*; Fr. *la danse Macabre*, or *la danse des morts*; Germ. *Todtentanz*): an allegorical representation of the power of Death over all classes and conditions of men. The name "Dance of Death" is derived from the mocking activity usually displayed by the skeleton figure of Death as he leads away his victims. As for the name "Macabre" sometimes given to this subject, it has puzzled scholars much, and has produced many absurd etymologies. The only one of these that needs to be noticed is that which connects the word with the story of the seven brothers whose fidelity to the Mosaic law cost them their lives and the life of their mother, as told in 2 Maccabees vii. It is supposed that in the earliest form of the crude drama, in which the Dance of Death was introduced, these brothers figured. But it is much more probable that the name came from the circumstance that the first representation, which took place in Paris in the monastery of the Innocents, was upon their day. Still, as their legend has nothing in it that connects them with this subject, a more reasonable explanation of the origin of the word is that it is derived from the Egyptian anchorite Macarius, one of the most famous of the hermit-saints. His legend connects him directly with warnings of death to the living. Though, as he was a Greek saint, his pictures are rare in the West, yet he is twice represented in the cemetery of Pisa—the Campo Santo—once by Pietro Laurati, and again in the fresco attributed to Orcagna and mentioned below. Vasari expressly tells us that the aged saint who is showing the three dead bodies to the hunting-party was meant for St. Macarius; and it is possible that his name may in time have come to be applied to the subject of which this fresco is a famous illustration.

Traces of the idea which was the foundation of the mediæval acted dramas and pictured or sculptured representations of this subject, so popular in Europe, are to be found in Italo-Greek and Roman antiquity. Douce says that on a sarcophagus found near Cumæ are sculptured three dancing skeletons, and that the same subject is on a Roman lamp and in a Pompeian fresco. On an antique gem in the Royal Gallery at Florence there is engraved an old man piping to a dancing skeleton; and though the introduction of the skeleton is rare, yet it is common enough to find on the Roman sarcophagi such representations of life interrupted by death as will abundantly connect the moralizing of those times with that of the Middle Ages. The earliest of the treatments of this subject in the form of dramatic representations—moralities—were acted in churches and by religious orders in the fourteenth century. It consisted of a dialogue in verse between Death and twenty-four or more followers. Originally, it would seem that the "Dance of Death," which in the fifteenth and sixteenth centuries was made to include a considerable number of people, was restricted to a few. As early as the thirteenth century there appeared a French poem called *Li Trois Mors et li Trois Vis*, that is, *Les Trois Morts et les Trois Vifs*. "This poem relates that three noble youths when hunting in a forest were intercepted by the like number of hideous spectres or images of Death, from whom they received a terrific lecture on the vanity of human grandeur." (*Douce.*) In 1335 Orcagna painted in the Campo Santo at Pisa his *Triumph of Death*, one of the earliest pictures of this subject, where three kings, with their ladies, companions, and servants, returning from hunting, come suddenly upon three open coffins containing the bodies of three persons, one of them a king, in various stages of decay. In his *Pardoner's Tale* Chaucer has also introduced a most powerfully imagined variation of the same theme. In 1425 the various scenes were painted in the monastery of the Innocents in Paris. After 1450 there was no representation of the drama, but the pictures retained their popularity. The best-known and most artistic series is by Holbein, fifteenth century, reproduced in Bohn's Illustrated Library, 1858, and by H. N. Humphrey (London, 1868). For the Lübeck form of the drama, see *Das Dodes Danz* (ed. H. Baethcke, Stuttgart, 1876); for the Basel pictures and verses, see *Der Todten Tantz, wie dieselbe in . . . Basel* (Leipzig, 1870); for the French form, J. Charlier de Gerson, *La Danse Macabre des Saints Innocents de Paris* (Paris, 1874); cf. J. G. Kastner, *Les Danses des Morts* (Paris, 1852).

Revised by SAMUEL MACAULEY JACKSON.

Dancing: a succession of rhythmical movements of the body, often accompanied by music. Dancing is of very early origin. The ancients constituted it a part of their religious observances, and danced before their altars and the images of their gods. The ancient Egyptians ascribed its invention to their god Thoth. All the different passions were expressed in dancing by the Greeks, and the dance of the Eumenides or Furies was so expressive of vengeance that it inspired the beholders with terror. The attitudes of the public dancers were studied by the Greek sculptors in order to delineate the passions. Aristotle ranks dancing with poetry. The Spartans were required to train their children in this art from the age of five. This was publicly done, to

train them for the armed dance, and was accompanied by songs or hymns. In ancient times, dancing in private entertainments was performed by professionals. The Romans counted it disgraceful for a free citizen to dance except as a religious rite.

In Egypt there are dancing and singing girls, who improvise verses and are called *almeh*. In India there are nautch (nâtch) girls, who dance on public occasions. Among savages dancing is still used as a religious rite or as a sort of state ceremony on important occasions. Among civilized nations it is a frequent mode of recreation.

Dancing Mania: an epidemic disorder of the fourteenth, fifteenth, and sixteenth centuries, similar to chorea. It is supposed that much imposture prevailed in many forms of this epidemic, but there were also many cases in which the subject entirely lost control of the will. This disorder is even now known in Abyssinia. Something similar to it in Italy was ascribed to the bite of a spider called the tarantula, but its greatest prevalence was in the cities of Germany during the Middle Ages. At Aix-la-Chapelle, in 1374, there appeared on the streets crowds of dancing men and women, apparently excited thereto by the frantic demonstrations at the festival of St. John. The dancers were said to be unobservant of outward things, but sensible of visions. They appeared to lose all self-control, and would dance till they fell as if dead, and would sometimes beat out their brains upon the ground. The mania extended to the Low Countries, as well as Cologne, Metz, and Strassburg, and caused much demoralization. Exorcism was at first found remedial, and cold water, as applied by Paracelsus in the sixteenth century, was very efficacious. At the beginning of the seventeenth century the St. Vitus's Dance, as the disorder was then called, was abating, and is now almost unknown. The "St. Vitus's Dance" of our day is CHOREA (*q. v.*). The excesses of the French "prophets" of the eighteenth century and the convulsive disorders sometimes seen in the camp-meetings in the U. S. are probably of similar character to the dancing mania. See J. F. C. Hecker, *Epidemics of the Middle Ages* (Eng. trans., 3d ed. 1859).

Dandelion [for earlier *dent-de-lyon* = Fr. *dent de lion*, lion's tooth, probably from the appearance of its leaves; cf. Germ. *Löwenzahn*]: the *Taraxacum officinale*, an herbaceous plant of the family *Compositæ*, with a perennial fusiform root. The leaves spring immediately from the root, are long, feather-shaped, with the divisions toothed, smooth, and of a fine-green color. The plant grows spontaneously in most parts of the globe. The leaves when very young are tender, and are often used as a potherb, and it is cultivated and brought to market in considerable quantities for this use. It is a popular remedy with many medical practitioners in the U. S. and Europe, having gentle tonic powers. The root is sometimes prepared and ground with coffee, the taste of which covers that of the dandelion. The plant called fall dandelion, in New England, is a species of *Leontodon*. See HAWKBIT.

Dandolo: noted Venetian family, extinguished in 1866. The most notable member was ENRICO; b. 1108; became Doge of Venice 1192; participated in the fourth crusade; conquered Constantinople June 17, 1203; established the Latin empire under Baldwin of Flanders, having himself declined the imperial crown. Though blind when elected doge his administration was brilliant. He secured to Venice her full share of the spoils of the conquest, both in provinces and treasure, besides commercial privileges of the greatest importance. The four horses which now adorn the western front of the church of St. Mark were among the booty which was carried to Venice. D. in Constantinople, June 1, 1205. See VENICE. C. K. ADAMS.

Dandruff: a kind of scurf that forms on the skin, especially the scalp. The outer layer of the skin is composed of minute horny plates, which are constantly and imperceptibly being rubbed or washed away. In the deeper layer are numerous oil glands, and these are especially well developed upon the hairy parts of the body. Upon the scalp there is frequently a tendency of the horny cells of the epidermis to be formed in excess, and this abnormal condition causes what is commonly known as the dry form of dandruff. Those suffering from this affection are usually annoyed by fine whitish scales falling upon the shoulders in greater or less quantity whenever the hair is brushed. This bran-like desquamation of the scalp is termed *Pityriasis capitis*. A similar mealy condition of the skin, with slight redness, is sometimes seen upon the face and other portions of the body. There is also a frequent tendency of the oil glands of the scalp to secrete an excessive amount of fatty matter or sebum, which usually dries upon the surface and forms a scurf or thin unctuous crust. To this form of dandruff the term *Seborrhœa capitis* has been applied. If the secretion from the glands is not removed by frequent washing of the scalp, it is apt to accumulate and form a thick greasy crust, accompanied by considerable itching and in time by falling of the hair. In most cases of dandruff there exists in the scurf which forms upon the scalp a mixture of epidermic scales and sebaceous matter.

As dandruff is a frequent precursor of baldness, the importance of treating it at an early stage is quite apparent. When no inflammation of the scalp is present, persistent washing and brushing will often restore the affected part to a normal condition. The practice of digging the scalp with a comb or wire brush and the use of stimulating "hair tonics" can not be too severely condemned.

GEORGE HENRY FOX.

Dandy Fever: See DENGUE.

Dane, NATHAN, LL. D.: jurist; b. in Ipswich, Mass., Dec. 27, 1752; graduated at Harvard in 1778. He was one of the most able lawyers of New England, and a member of the Continental Congress in 1785–88. In 1787 he framed the ordinance for the government and organization of the Northwest Territory, in which he inserted a clause prohibiting slavery; also one prohibiting all laws impairing the obligation of contracts. This, a few months later, was inserted in the U. S. Constitution. He served in the State Senate for several years (1794–98); in 1811 was appointed a commissioner to revise and publish the charters which had been granted in Massachusetts, and in 1812 to make a new publication of the statutes. He published *An Abridgment and Digest of American Law* (9 vols., 1823–29), and an *Appendix* (1830). In 1829–31 he gave $15,000 to Harvard College, to found the Dane professorship of law. D. in Beverly, Mass., Feb. 15, 1835.

Danegelt, or **Danegold** (i. e. Dane-money or Dane-tax): a tribute of one shilling levied on every hide of land by the Anglo-Saxon and early Norman kings originally for the purpose of buying off the Danes. It was subsequently increased to two shillings, and though abolished by Edward the Confessor and again by Henry II. it reappeared for a time as late as the reign of Richard I.

Danelag [for O. Eng. *Dena lagu*, law of the Danes]: name applied under the later Saxon and earlier Norman kings of England to fifteen or more counties of the north and east of England, where the Danes were confined by the wars of Alfred the Great; reduced by Edward the Elder (901–925); rose in revolt in the reign of Eldred, but were forced into submission in 954.

Danenhower, JOHN WILSON: Arctic explorer; b. in Chicago, Ill., Sept. 30, 1849; educated in the public schools of Chicago and Washington; graduated from the U. S. Naval Academy, 1870; commissioned as ensign, 1871; as master, 1873; as lieutenant, 1879; served on a surveying expedition in the North Pacific 1873–74; served on the Vandalia during Gen. Grant's visit to Egypt and the Levant; joined the Arctic steamer Jeannette at Havre, France, making the voyage to San Francisco and into the Arctic Ocean. The expedition left San Francisco July, 1879; the vessel was crushed, and the crew retreated for ninety-five days over the ice. Lieut. Danenhower commanded a boat which landed at Lena Delta, Sept. 17, 1881, and reached the U. S. in June, 1882. Author of *The Narrative of the Jeannette* (1882). D. at Annapolis, Apr. 20, 1887.

Danes: a yellow-haired, blue-eyed people of moderate height, bearing resemblance to the Northern Scandinavians, their kinsmen. The Danish peasant holds his land independently, is a gay, careless person, taking an interest in polities and current events, and fairly educated. The Danish painter represents faithfully all form, but is lacking in vivid coloring and imagination. The Danes delight in music, and boast composers like Hartmann and Gade. See DENMARK.

Danes Island: See the Appendix.

Danforth, MOSELEY ISAAC: See the Appendix.

Daniel (God is Judge, or God will judge): one of the great Hebrew prophets; was a youth when he was carried with many other Jewish captives to Babylon in 605 B. C. Whether he was of royal or only of noble descent can not be determined. He was educated at the court of Nebuchadnezzar, and was eminent for learning and wisdom. His

skill in the interpretation of dreams procured for him the favor of the king, who appointed him governor of the province of Babylon and chief of the magi. He explained the handwriting on the wall at Belshazzar's feast about 538 B. C. After the capture of Babylon by the Medes and Persians, Daniel gained the favor of Darius the Mede, and was the first of three presidents who had authority over the 120 satraps of the empire. He also "prospered in the reign of Cyrus the Persian," and appears to have remained in Babylon when the other Jews returned to Jerusalem. He probably lived at least ninety years.

DANIEL, BOOK OF: an important canonical book of the Old Testament, counted in some Christian traditions as one of the four books of the major prophets, but properly classified among the Hagiographa or *Chetubim*. (See BIBLE.) The book has commonly been divided into two parts, of six chapters each—the first six historical, the last six prophetical. Some recent critics maintain that the first seven chapters treat of the world-power in relation to the kingdom of God; the last five chapters treat of the kingdom of God and its development in relation to the world-power. The book is remarkable both for its miracles and its prophecies. The close general correspondence of these prophecies with the recorded facts of history has led some writers to the belief that the book is not the work of Daniel, as it purports to be, but that it was written by some unknown person at a much later period. This view, which is as old as the time of Porphyry, has been revived and maintained by Collins, Semler, De Wette, Ewald, and others. On the other side, the evidence for the genuineness of the book is satisfactory to the representatives of orthodox theology. Among the points in its favor are the following: 1. The New Testament decidedly affirms its authority in many places. 2. The Maccabean literature and the Septuagint translation show that the book was in existence before the date assigned to it by rationalists (175 B. C.). 3. The book was written partly in Hebrew and partly in the older Chaldee, as might naturally occur at the period when it purports to have been written. This point appears decisive in favor of the genuineness of the work. 4. So far is the book from being a copy of history that even now the historical application of some of its parts is a matter of controversy. 5. It is remarkably free from the characteristic beliefs of the later Judaism. The exegetic and controversial literature upon the book of Daniel is very extensive. The best modern commentaries in English are by E. B. Pusey (London, 1864); P. L. Desprez (1879); J. G. Murphy (1884); R. P. Smith (1886); and A. A. Bevan (1892).

Daniel, dăă'ni-el', ARNAUT: Provençal poet; one of the most famous of the Troubadours; flourished about 1180–1200. Dante (*de Vulg. Elog.* ii. 2) speaks of him as *par excellence* the poet of love; and in another place (*Purgatorio* xxvi. 115, *seq.*) makes Guido Guinicelli call him "the best smith of his mother-tongue." Petrarch also (*Trionfo d'Amore* iv. 40) designates him "*gran maestro d'amor, ch'alla sua terra ancor fa onor col dir polito e bello.*" These citations show clearly the esteem in which he was held. Little, however, is known of his life. We are informed that he was a nobleman of Ribeyrac in Périgord; that he loved and served a distinguished Gascon lady, wife of Guillaume de Bonville; and that he passed his last years in a monastery. Eighteen undisputed poems by him are known to us, and all of them prove the accuracy of Dante's term, "smith of his mother-tongue." They are, in fact, excessively artificial in manner and slight in matter. Arnaut Daniel was the inventor of the poetic form afterward called by the Italians the sextine. See U. Canello, *La vita e le opere del trovatore Arnaut Daniel* (Halle, 1883). A. R. MARSH.

Daniel, HERMANN ADALBERT: divine and geographer; b. at Köthen, Germany, Nov. 18, 1812; studied theology at the pedagogium in Halle, where he afterward became professor. His chief theological works are *Thesaurus Hymnologicus* (5 vols., 1841–56) and *Codex Liturgicus Ecclesiæ Universæ*, etc. (4 vols., 1847–54); his best geographical works are *Leitfaden für den Unterricht in der Geographie* (68th ed. 1872) and *Handbuch der Geographie* (3d ed. 4 vols., 1870–71). D. in Leipzig, Sept. 13, 1871. See *H. A. Daniel, ein Lebensbild* (1872).

Daniel, JOHN MONCURE: See the Appendix.

Daniel, JOHN WARWICK: U. S. Senator; b. at Lynchburg, Va., Sept. 5, 1842; educated at Lynchburg College and Harrison University School; major and adjutant-general on Gen. Early's staff in the Army of North Virginia, in which he served throughout the war; studied law, University of Virginia, 1855–56; elector at large on the Tilden and Hendricks ticket, 1876; member Forty-ninth Congress; entered U. S. Senate as a Democrat to succeed William Mahone Mar. 4, 1887; re-elected 1891 and 1897. C. H. T.

Daniel, SAMUEL: poet; b. at Taunton, England, in 1562; was educated at Oxford. He lived in London, where he associated with Shakspeare and Marlowe, and was employed as tutor to Anne Clifford, who became Countess of Pembroke. In 1603 he was appointed master of the queen's revels. He wrote, besides other poems, *The Tragedy of Cleopatra* (1594); an historical poem *On the Civil Wars of York and Lancaster* (1595); *Poetical Essays* (1599); and among prose works a *Defense of Rhyme* (1602) and a *History of England* (1613–34). D. at Beckington, Oct. 14, 1619. His works were reprinted in 1885–87.

Daniell, JOHN FREDERICK, F. R. S., D. C. L.: scientist; b. in London, Mar. 12, 1790. He published *Meteorological Essays* (1823). In 1831 he became Professor of Chemistry in King's College, London. He was the inventor of the galvanic battery by which it was made possible to maintain a current sensibly constant for a long time, and for this he received the Copley medal in 1837. In 1839 he published an *Introduction to Chemical Philosophy*. His is one of the great names of electrical science, and his *Meteorological Essays* constituted the first attempt to explain the phenomena of the weather by physical science. D. Mar. 13, 1845.

Daniels, WILLIAM HAVEN: See the Appendix.

Dan'ielson: borough; in Killingly, Windham co., Conn.; on the Quinebaug river, and the Norwich and Worcester division of the N. E. Ry.; 26 miles N. N. E. of Norwich (see map of Connecticut, ref. 8–L). It has cotton-mills and shoe-factories. Pop. (1900) 2,823.

Danielsson, daa'ni-el-sŏn, OLOF AUGUST, Ph. D.: philologist; b. in Häradshammar, province of Östergötland, Sweden, Oct. 15, 1852; educated at the Universities of Upsala and Leipzig; from 1879 to 1891 docent in classics, and since 1891 Professor of Greek in the University of Upsala; author of *Grammatiska Anmärkningar* (2 pts., 1881–83); *Grammatische und etymologische Studien* (1888); *Epigraphica* (1890); all published in the *Upsala Universitets Årsskrift*.

B. I. W.

Danish Language: genetically a member of the Scandinavian division of the Teutonic group. Within the Scandinavian division it forms, again, with Swedish the minor group East Norse, in contradistinction to West Norse, composed of Icelandic (Faroese) and Norwegian. Its present territory is the kingdom of Denmark, consisting of the Danish islands and Jutland, together with the adjoining northern part of Schleswig; to which is to be added since the end of the fourteenth century Norway, where it is, with some modifications, not only the literary and official medium, but the spoken language of the cultured classes. See NORWEGIAN LANGUAGE.

The history of the Danish language, as such, begins only after the introduction of Christianity in the eleventh century. During the Viking age (700–1050) and later the name *dønsk tunga*, Danish language, was applied both in Scandinavia and in England to the language of the entire North, but local differences had begun to show themselves even early in this period, and at its end had so far advanced that it is possible to speak of distinct dialects. These differentiations are, nevertheless, in the eastern group not sharply carried out, and Danish and Swedish, with the exception of one of its dialects, Old Gutnic, remain almost identical, even as far down as the development of a Danish literature after the thirteenth century.

The material for this earliest period in the history of Danish consists first of all in Runic inscriptions. It is only, however, when with the end of the thirteenth century a literature begins to appear that an adequate view of the language is presented, and its history can be satisfactorily followed. The language territory in the Old Danish period included not only the islands and Jutland, but the whole of Schleswig and the South Swedish provinces of Skaane, Halland, and Blekinge. Three principal dialectic groups are distinguished: a Skaane group, spoken in South Sweden and in the island of Bornholm; a Zealand group, in the remaining islands; and a Jutish group, in Jutland and Schleswig. The Zealand dialect became the literary language toward the end of the fifteenth century, a result that was in great part due to its use in several of the earliest printed books.

Modern Danish is the direct descendant of the Zealand dialect of Old Danish. Its beginning is approximately coincident with the Reformation, and its earliest literary monument is the Danish translation of the Bible, the so-called Christian III. Bible of 1550. The language as a whole had long before this period assumed a thoroughly characteristic form. The general tendencies toward weaker phonetic conditions and simpler inflections, which had shown themselves dialectically almost from the beginning, had in some cases already been carried out, as, for instance, the specific Danish change during the thirteenth and fourteenth centuries of *k*, *t*, *p*, to *g*, *d*, *b*, after vowels. In the fourteenth and fifteenth centuries falls, too, the first considerable influx of foreign words, Low German forms, namely, that were introduced through commercial connection with the Hanse cities. The influence of German upon the vocabulary, rendered easy at the outset by the contiguity of German territory and the inherent similarity of the adjoining dialects, is one of the most important elements in the external history of Danish. It was further exerted, after the middle of the fifteenth century, under the Oldenburg kings, and in the sixteenth century by the Reformation and the retranslation of Luther's version of the Bible into Danish, and the development, in this and the following century, of a whole literature of translation based upon German originals. Finally, in the eighteenth century, under Christian VI. and VII., German became the official language, and in part the medium of public instruction. The result of this extended influence upon the vocabulary has been to make it in its origin at least half German, although these elements have been thoroughly assimilated and accommodated externally to the formative spirit of the language. Since the latter half of the eighteenth century, when the language may be said to have assumed its present appearance, a reactionary tendency has set in to make it in form more characteristically Scandinavian by means of a purification of the orthography, the exclusion of additional German words, and the reinstatement of Danish forms.

The principal typical characteristics of Danish as a Scandinavian language are the use of the suffixed definite article with substantives, and the formation of a passive voice of verbs by the addition of the reflexive pronoun, in Danish *-s*, to the active form. With Swedish, as contrasted with West Norse, its most prominent agreements are the change of the diphthongs *ei*, *au*, and *ey* to the long vowels *e* and *ø* respectively, and the almost total absence of *u-* umlaut. Unlike Swedish, however, it has throughout weakened the vowel of the inflectional ending (in Swedish still *a* and *o*) to a voiceless *e*. Swedish still further differentiates itself from Danish by the retention of the old *k*, *t*, *p*, after vowels, and has characteristically maintained as a whole a much more ancient condition. In the simplification of grammatical forms Danish occupies an extreme position. The distinction of masculine, feminine, and neuter in substantives and adjectives has been reduced to two, in that masculine and feminine have been united to a common gender; in the declension of substantives but a single case ending, *-s* in genitive singular and plural, has been retained; in the verbal inflection there is throughout no distinction of person.

Within Danish territory itself the spoken dialects have maintained themselves side by side with the literary language in two main groups—the dialects of the islands and of Jutland. The former, out of which the literary language proceeded, naturally most nearly approximates the literary form. In general the dialects have been less conservative than the literary language. This is particularly the case in Jutland, where, for instance, in some localities all distinction of gender is lacking, and even such an inherent Scandinavian characteristic as the suffixed article has wholly disappeared.

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For the pronunciation of the language, see the article by Henry Sweet, *Danish Pronunciation*, in *Transactions of the (English) Philological Society* (1873–74). An exhaustive scientific treatment of older Danish is contained in the chapter by Adolf Noreen, *Geschichte der Nordischen Sprachen*, in Paul's *Grundriss der Germanischen Philologie* (Band i., Strassburg, 1891).

William H. Carpenter.

Danish Literature.—*Pre-Reformation Period.*—The claim of Denmark to share in the glories of the Old Northern literature rests chiefly on inferential grounds. The sagas are an Icelandic development; the skaldic poetry is Icelandic-Norwegian, and the songs of the so-called Elder Edda (see Edda) belong to Iceland and Norway, if not to Iceland alone. (See Icelandic Literature.) It is, however, strongly probable *a priori* that the Danes had their own heroic and mythological lays (or their own versions of lays that were common property in Scandinavia), and some of these are no doubt preserved, though in a much altered form, in the *Historica Danica* of Saxo Grammaticus, finished about 1207. (See Saxo.) Though Saxo has much to say about written sources, it is doubtful if any of the Danish poems which he paraphrased had ever been committed to writing. The prose parts of his work must also be to a considerable extent based on oral tradition, whether song or story. Some of the Danish popular ballads also give echo from heathendom, but none of these are preserved in anything but a comparatively modern form. (See Ballads.) The oldest laws date in part from the heathen age, though not codified till Christian times.

By the middle of the tenth century Christianity had become firmly established in Denmark, but it was some time before the new religion produced any literary activity. Of the Latin historical or biographical works that precede Saxo little need be said. They are brief and feeble, mostly of the ordinary monkish pattern, and show no national or popular spirit, being intended rather to edify than to instruct or inspire. Three of them deal with the king, St. Knut: *Passio S. Kanuti*, *De Martyrizatione S. Kanuti*, and *Historia Ortus Vitæ et Passionis S. Canuti*. These were doubtless all composed between 1095 and 1125 on Danish soil; but the *Historia* is the work of the English monk Ælnoth, and the other two are perhaps also by foreigners. The *Iter Hierosolymitanum Svenonis* and the *Vita Beati Chetilli* also belong to the twelfth century.

Of a somewhat more popular character is a Latin account of the life of St. Knut (Knut Lavard, Duke of Schleswig), written about 1170 and preserved in a MS. of about 1300. A longer *Life* of the same saint, ascribed to a Scotch ecclesiastic, Robertus Elgensis, is unfortunately lost, except for a few fragments. (See Waitz, *Abhandl. der k. Gesellsch. d. Wissensch. in Göttingen, Phil.-hist. Cl.*, viii. 3 ff.) Besides these biographies, we have *Calendaria*, *Necrologia*, *Libri Datici*, which are merely records, and, though important for the historical data they contain, can not be regarded as literature. The earliest *Annals* are of a similar enumerative character, but these gradually become less arid. Among the most interesting is the *Anonymi Roskildensis Chronicon Danicum* (from 826 to 1157), which, however, is partly abstracted from Adam of Bremen. Of a very different sort is the *Compendiosa Regum Daniæ Historia* of Svend Aagesen (Sven Aakessøn), which gives evidence of warm national feeling. Svend was a friend of Saxo, and, like Saxo, based his history on oral tradition, at least in part. Most of the works mentioned in this paragraph may be found in the great collection known as Langebek's *Scriptores Rerum Danicarum Medii Ævi* (Copenhagen, 1772–1878).

The *Historia Danica* of Saxo Grammaticus (finished about 1207) is, though written in Latin, one of the most notable works in the whole course of Danish literature. A storehouse of ancient heroic tradition, its importance in several later periods of literary history, and especially at the time of the Romantic revival, can hardly be rated too high. But its effect on the Latin writers that immediately followed Saxo is hardly perceptible. Annals, chronicles, and accounts of ecclesiastical personages and foundations continued to appear. From the fourteenth century may be mentioned the *Compendium Historiæ Danicæ*, which long went under the name of Thomas Gheysmer (alive in 1431), but which is now known to have been written not far from 1350. This is in part an abstract from Saxo's *Historia*, which it brings down to 1341. It includes some traditional matter, and is marked by some warmth of patriotic sentiment. The system of the schoolmen was made known to Denmark by a contemporary of Saxo—Anders Sunessøn (Archbishop of Lund 1201–22)—whose two Latin poems, the lost *De Septem*

Sacramentis and the *Hexaëmeron*, an account of the Creation with an exposition of Peter Lombard's theology, had of course nothing national about them.

Of *vernacular literature* the oldest monuments are the laws. Of these, the *Skaanske Lov* (Law of Skaane) is referred to the beginning of the thirteenth century, but must be derived from a redaction still more ancient. The two Sealand codes (known conventionally as Valdemar's and Erik's), the *Jydske Lov* (Law of Jutland) and the by-laws of Flensborg, are extant in manuscripts of about 1300. All these laws are essentially of a popular character and appear to be in the main digests of very old customary codes. Most of them are published in the collection of *Nordiske Oldskrifter udgivne af det Nordiske Literatur-Samfund*. Next in age to the laws are the two *Urtebøger* (Plant-books) and the *Stenbog* (Stone-book, chiefly from Marbodus *de Lapidibus*), which go under the name of the physician Henrik Harpestreng (d. 1244). (See *Henrik Harpestrengs Danske Lægebog udgivet af Christian Molbech*, Copenhagen, 1826; cf. L. Pannier, *Les Lapidaires françaises du Moyen Âge*, Paris, 1882, pp. 15 ff.) It is possible, however, that Harpestreng wrote in Latin, and that the Danish version was made forty or fifty years after his death. In a Latin life of St. Niels, written about 1300, a vernacular biography of the same saint is mentioned, but this is lost.

It appears, then, that the conversion of Denmark to Christianity had no appreciable effect in the direction of developing a national literature in the centuries preceding 1300. Nor did the new religion introduce the Danes to any extent to the sort of literature which mediæval Christianity produced or fostered in other countries. The same continues true of the period from 1300 to the Reformation. Neither the Romantic nor the religious literature of the Middle Ages is represented in Denmark, except by a few translations and imitations, mostly of the feeblest kind and often made at second hand. Sweden was much more productive, and Norway was in the twelfth and thirteenth centuries a center of great literary activity. (See Swedish Literature and Norwegian Literature.) It is of course possible that many Danish compositions have been lost, but those which remain are not of a kind to make us greatly regret what may have perished.

Romantic literature is very sparsely represented in mediæval Danish. In this respect the contrast to the activity shown in translating French works into Norwegian is striking. The three *Eufemia-Viser* (Euphemia-songs; so called from the Norwegian queen by whose order the Swedish translation was made)—*Ivan Lejonriddaren* (the *Chevalier au Lion* of Chrétien de Troies), *Hertig Fredrik af Normandie* (Duke Frederick of Normandy), and *Flores og Blanzeflor*—were turned into Danish verse in the fourteenth century. From the fifteenth century we have *Dværgekongen Laurin* (The Dwarf-king Laurin, i. e. *Der kleine Rosengarten*), translated from the German; *Persenober og Konstantinobis* (a version of *Parthonopeus de Blois*), translated rather from a lost Norwegian version than from the *Partolopes Saga* that has survived; and *Den kyske Dronning* (The Chaste Queen). The last (which is dated 1482) and perhaps the second are the work of one Jep Jensen. The story of Charlemagne in a Danish translation (*Karl-Magnus Krønike*), which is from the Norwegian *Karlmagnus Saga*, either directly or through the Swedish, is preserved in a manuscript of 1480. This is accounted the best Danish prose of the century. It was printed in 1501, revised by Christiern Pedersen, and printed again in 1534, and has often been republished as a *votksbuch*. *Olger Dauskes Krønike*, an abridgment of the Old French romance of *Ogier le Danois*, was published by Pedersen in 1534.

In the fourteenth century the Birgittine Order was founded by St. Birgitta (*q. v.*) of Sweden, who was born in 1302 or 1303 and died in 1373. To the impulse given to vernacular composition by this order, the religious literature of Sweden, and to a considerable extent of Denmark, from 1350 to the Reformation, owes its existence. The oldest Danish version of the Bible (Genesis–2 Kings xxiii. 18) comes from a Birgittine monastery. It is preserved in a MS. of about 1480, but is itself older. (See Molbech, *Den ældste danske Bibel-Over-sættelse*, Copenhagen, 1828.) A considerable number of works of edification were translated from Latin or from Swedish under the more or less direct influence of the Birgittine movement. The most important are Bonaventura's *Meditationes Vitæ Christi* (from Swedish, about 1400); Suso the German mystic's *Horologium Æternæ Sapientiæ* (from Latin, about 1450); the *De Imitatione Christi* of Thomas à Kempis (about 1450); and *The Virgin Mary's Rosary* (Iomffrw Marie Rosenkrantz, about 1496), a working-over by the priest Mikael of Odense of the *Psalterium Beatæ Virginis* of Alain de Roche (Alanus de Rupe, b. 1428 (?); d. 1475). Other poems by Mikael are *Om Skabelsen* (On the Creation) and *Om Menneskets Levned* (On the Life of Mankind). In prose legends the poverty of Denmark is in striking contrast to the richness of Sweden. The most important collection is *De Hellige Kvinder* (Holy Women), preserved in a MS. of about 1450, and containing eight biographies, but there are fragments of other cycles. At this point may be mentioned the Danish *Lucidarius* (fifteenth century), a brief popular encyclopædia based on the work of Honorius Augustodunensis. The Danish *Postille* of Christiern Pedersen (printed 1495) may be taken as marking the close of the religious literature of the Catholic or mediæval period. Pedersen afterward became one of the Reformers in Denmark.

The most remarkable vernacular work of the pre-Reformation period is the fifteenth century *Danske Rimkrønike*, a rhymed chronicle of 5,095 verses, in which all the kings of Denmark, mythical and historical, to the death of Christian I. (1481), give an account of themselves in the first person. Much of the work is paraphrased from Saxo, and it is precisely this portion that has had most influence on the life, thought, and ultimately on the literature of the Danes. The lively and popular style of the *Rimkrønike* soon made it a great favorite with the people. It was the first book printed in Danish (1493), and was several times reprinted before 1600. Its effect in keeping alive some feeling for the ancient traditions of the country, and so in preparing a way for that genuinely Danish literature which, however, was not to appear for more than two centuries, may be compared to the effect of the popular ballads. The chronicle was written in the Sealand dialect, and had much to do with the establishment of that dialect as literary or standard Danish. In the composition of rhymed chronicles Sweden anticipated Denmark by more than a century; but it is not certain that this particular work, with its trick of making each king tell his own story, owes anything directly to Swedish. See Rosenberg, *Nordboernes Aandsliv*, ii. 383–394.

The *popular ballads* (*Folkeviser*) are preserved in manuscripts of the sixteenth and eighteenth centuries, or by oral tradition; one fragment is extant in a manuscript of about 1450. It is clear, however, that many of these songs, some of which are of rare excellence, are much older than the oldest of the manuscripts, and some of them doubtless go back to the thirteenth century; a few, as has already been remarked, even give echo from heathendom. Most of the ballad manuscripts are the work of ladies of rank, whence it is inferred that their contents were in favor in the best society of the seventeenth and eighteenth centuries. The earliest printed collection was that of Vedel (1591), enlarged by Peder Syv in 1695, and many separate ballads circulated as broadsides. Thus this important source of literary freshness and inspiration was accessible to all ranks even in the arid "Learned Age," and in the century of Holberg—a fact which should not be forgotten in estimating the causes of the Romantic revival. The standard edition of the ballads is that of Svend Grundtvig, *Danmarks Gamle Folkeviser* (1853 ff., unfinished); see the bibliography at the end of the article Ballad Poetry, and Steenstrup, *Vore Folkeviser fra Middelatderen* (Copenhagen, 1891).

From the Reformation to 1700.—The Lutheran Reformation was legally established in Denmark by the ordinance of 1537. The new period opened auspiciously for the vernacular literature. The unreadable 1524 version of the Scriptures, which goes under the name of Hans Mikkelsen, was soon replaced by *Christian III.'s Bible* (1550), mainly the work of Christiern Pedersen. This remarkable book, for which Luther's German Bible served as a model, not only raised the Sealand dialect at once to the position of the Danish literary language, but substantially fixed the form of that literary language. The necessity of making the new doctrines intelligible to the unlearned produced a multitude of devotional and theological books in Danish, the most important of which is *Liffsens Vey* (The Way of Life, 1570), by Niels Hemmingsen (1513–1600), perhaps the greatest of Danish theologians. The silencing of Hemmingsen for holding Calvinistic opinions was not only a check to the spread of a national literature, but was significant of the coming reaction. With the triumph of Lutheran conformity the literary promise of the early Reformation period came to an end. *A learned age* succeeded, which lasted till

about 1710. The university in a sense severed its connection with the world. Scholars formed an exclusive guild, concerning themselves little with the popular life. Polymathy and its inevitable companions, pedantry and superficiality, flourished. Great names in science and scholarship belong to this period—Tyghe (Tycho) Brahe, the astronomer (1546-1601); Brochmand, the theologian (1585–1652); Ole Worm, the antiquary (1588–1654); Kaspar Bartholin, the physician (1585–1629); Thomas Bartholin (1616–80) and Niels Stensen (1638–86), the anatomists; Ole Rømer (1644–1710), who in 1675 calculated the velocity of light—but none of these men did anything to encourage a national literature, and the condition of the people was one of great intellectual dullness. The court spoke German, scholars spoke and wrote Latin. Yet there were significant exceptions to the general neglect of Danish. The popular ballads, as we have seen, were sung and collected by ladies of rank. A hundred of these songs were edited in 1591 by Vedel (1542–1616), who also did good service by his translation of Saxo (1575). The Norwegian Peder Claussøn Friis (1545–1614) translated Snorri's *Konungasögur*. Peder Syv (1631–1702), the author of the first Danish grammar in the vernacular (1685), re-edited Vedel's ballad-collection, adding a second hundred (1695). Religious lyric reached a high position in the psalms and hymns of Thomas Kingo (1634–1703). The Norwegian Peter Dass (1647–1708) also deserves mention as a hymn-writer, but still more for his descriptive poem *Nordlands Trompet* (begun 1678), which has remained popular as a chapbook. Of a different sort was the influence of Anders Arrebo (1587–1637), who made a partly successful attempt to introduce into Denmark the spirit of the Renaissance. Arrebo is particularly noteworthy for his reformation of Danish meter in accordance, to a considerable extent, with the rules of Martin Opitz. See G. Rode, *Renaissancens tidligste Eftervirkning paa dansk poetisk Literatur* (Copenhagen, 1866).

Though there is abundant evidence that Denmark was not ignored by the mediæval *joculatores*, we have no testimony for a regular drama till the latter half of the fifteenth century. Danish dramatic history begins with three vernacular plays of the pre-Reformation period—the *Comœdia de Sancta Dorothea* (1531) and two other comedies, called by their editor *De utro Hustru* (The Faithless Wife) and *Paris's Dom* (The Judgment of Paris). The *Dorothea* is the work of one Christiern Jensen (or Hansen), who may also be the author of the other two. These plays belong to the school-drama category, and were doubtless performed by grammar-school scholars. They have been edited by S. Birket Smith (*De tre ældeste danske Skuespil*, Copenhagen, 1874). During the sixteenth and seventeenth centuries the school-drama continued to be productive. The plays dealt with both sacred and profane subjects, and were sometimes performed at court. The most important playwrights are Peder Hegelund (1542–1614) and Hieronymus Ranch (1539–1607), both schoolmasters. (See S. Birket Smith's edition of Hegelund's *Susanna og Calumnia*, Copenhagen, 1888–90, and of Ranch's *Skuespil*, Copenhagen, 1876–77.) Though the school-drama served to some extent to foster a taste for dramatic representation, it exercised no such influence on Holberg and his successors as can be traced in the case of the mediæval English plays in their relations to the Elizabethan revival. After Hegelund and Ranch, indeed, there is a distinct decadence, which may be ascribed in part to the discouraging effect of the Learned Age on vernacular literature.

Holberg and his Successors (1710–1800).—The credit of breaking away from the scholasticism of the Learned Age belongs to Ludvig Holberg (1684–1754), whose literary activity lasted from 1711 till the time of his death. A man of culture and learning, well versed in French and English literature, Holberg worked with one clearly defined purpose —to rescue the Danish people from their intellectual stagnation and social provincialism. In his historical writings he aimed to make the results of scholarship accessible in the vernacular; in his satirical poems and his comedies, to amuse while inculcating some moral or social lesson. No part of his work failed of its aim, but it is on his comedies that his fame chiefly depends. These were written for the newly opened Copenhagen theater. They form a long series of brilliant dramatic sketches, modeled on Molière and showing English influence as well, but finding their material in contemporary Danish life and manners. Their inexhaustible humor and good-nature so far deprived their satire of its sting that the author was able to teach his lesson and to delight his audience at the same time. The fun, though not always refined, sinks to positive coarseness surprisingly seldom. Holberg's style is always lively and attractive, but his language shows a greater proportion of French words than it was the lot of Danish finally to assimilate. Holberg was by birth a Norwegian; but there is no separating Norwegian literature from Danish from the time of the Reformation, when the Sealand dialect became the literary language of Norway as well as of Denmark, till the separation of the two countries in 1814. See Danish Language, Norwegian Language, and Norwegian Literature.

Though he left no disciples, Holberg is with much propriety called the father of Danish literature. He successfully asserted the rights of the vernacular; he showed that authorship might be made lucrative, and he created a reading public. The period from his death till the rise of the Romantic school under Oehlenschläger (sometimes called the *Age of Enlightenment*, 1750–1800) was a time of misguided effort in literature rather than of performance. The intellectual turmoil in which the nation was involved by the contest between orthodoxy and free thought was not favorable to creative genius, and there was grave danger that Danish literature would wear itself out in pitiful imitation of second-rate French and German models. For nearly twenty years (1751–70) Klopstock resided at Copenhagen as a sort of literary dictator (see F. Rønning, *Rationalismens Tidsalder, I. Det Klopstockske Tidsrum*, Copenhagen, 1886), exercising an influence from which even so original a genius as Johannes Ewald (1743–81), the great lyric poet, freed himself with difficulty. Ewald's tragedy of *Balder's Død* (Balder's Death, 1773) is important not only as signaling his final emancipation, but as pointing out the path that Danish Romanticism was to follow. (See Rønning, *Rationalismens Tidsalder, II. Det Ewald-Wesselske Tidsrum*, 1770–85, Copenhagen, 1890.) His contemporary, the Norwegian Wessel (1742–85), though his literary opponent, was unconsciously working to the same end when, by his celebrated dramatic parody *Kjærlighed uden Strømper* (Love without Stockings, 1772), he did so much to free the stage from its servitude to French sentimentalism. The great comic poet Jens Baggesen (1764–1826) marks the end of this period, but his unique genius forbids our reckoning him as a member of any school. His *Komiske Fortællinger* (Comic Stories, 1785), which shows Wessel's influence, made him the literary lion of the day, and his prose, seen at its best in his *Labyrinthen* (The Labyrinth, a work of travel, 1792–93), would alone entitle him to a high position as a classic. But his spirit and his life were alike too restless for sustained effort. He understood and partly sympathized with the Romantic movement; but his love of clearness and his sense of form were offended at some of its tendencies. The result was a long literary feud with Oehlenschläger, which is perhaps the most humiliating chapter in the annals of Danish letters. See K. Arentzen, *Baggesen og Oehlenschläger* (8 vols., Copenhagen, 1870–78).

The Romantic Period.—The center of the Romantic movement in Denmark was Adam Oehlenschläger (1779–1850). Introduced to the ideals of German romanticism by Steffens, one of the immediate disciples of Schelling, Oehlenschläger became an ardent devotee of the new school, and never wavered in his allegiance. The robustness of his genius, however, prevented his being a mere imitator, and his fortunate choice of subjects (made under the influence of Ewald's *Balder's Død*) was an additional safeguard against the danger of sentimentalism. In the mythical and heroical song and saga of the North Oehlenschläger found material for a series of noble poems, epic and dramatic, which at once raised Danish literature to an honorable position in European letters. It is largely due to him that Danish Romanticism did not fritter away its strength in whimsical prettiness like that of the Swedish Phosphorists, but became a regenerating force not only in art and letters, but in the whole social and political life of the people. Contemporary with Oehlenschläger, but surviving him more than twenty years, N. F. S. Grundtvig (1783–1872) deserves mention in the same breath as bearing no small share in the restoration of a healthy national life. Grundtvig is often accounted a member of the Romantic school, partly because of the freshness and enthusiasm of his genius, partly because of the nature of the subjects with which his writings deal; but this classification is not quite sound. Grundtvig's aim was not artistic, but practical; he valued literature and scholarship only as a means to the ethical and religious regeneration of the people, and for this he labored with tongue and pen throughout his long life. Though an eminent

scholar, an eloquent preacher, and a great poet, it is, after all, as the religious and educational reformer that his influence will longest endure. Grundtvig's teachings, in insisting on the joyous side of Christianity, are in strong contrast to those of his younger contemporary, the theologian Søren Kierkegaard (1813–55), whose ideals were too austere to be humane; but in one regard both worked to a common end, the substitution of a living, efficient Christianity for the peculiarly deadening form of rationalism that had long held sway in the Danish Church, and it is no accident that their labors coincide in time with the supremacy of Romanticism in literature.

The Romantic revival was prolific of authors, many of whom achieved distinction. A few only can be mentioned. Ingemann (1789–1862), though a poet of much merit, is chiefly important for introducing the historical romance, a kind of writing for which the Danish genius has since shown itself especially adapted. Hauch (1790–1871) wrote poems, dramas, and novels; Winther (1796–1876) was also a poet and a romance writer. Hans Andersen (1805–75) won world-wide reputation as the author of fairy-tales. J. L. Heiberg (1791–1860), though distinctly a Romanticist, was of intellectual kin to Baggesen, and occupies a somewhat peculiar place, from the possession of Romantic tendencies combined with an elegance of mind almost French and the keenest critical powers. His vaudevilles entitle him to be called the reviver of Danish comedy. The dramatists Hertz (1798–1870) and Overskou (1798–1873) were his disciples. His mother, the Baroness Gyllembourg-Ehrensvärd (1773–1856), was a novelist of distinction. Bödtcher (1793–1874) wrote lyrics of marvelous beauty of finish. Paludan-Müller (1809–76) belongs rather to the circle of Heiberg, whose influence is most perceptible in his earlier poems, than to that of Oehlenschläger; but shows in his religious and ethical system a striking affinity to Kierkegaard. (See G. Brandes, *Moderne Geister*, 1882, pp. 339–86.) He is, however, nobody's disciple, and is justly regarded as almost contesting the palm with Oehlenschläger. His great satiric epos *Adam Homo* is remarkable for its realistic spirit, but the rest of his work makes it proper to regard him as belonging to the Romantic school. See also articles on Bergsøe, Bøgh, Brosbøll, H. F. Ewald, Holst, Hostrup, Kaalund, C. K. F. Molbech, von der Recke, Richardt, Rumohr, de Saint-Aubain, and Schack von Staffeldt.

The Latest Period.—The death of Christian VIII. in Jan., 1848, the February Revolution in France, and the revolt of the Schleswig-Holsteiners in March, were for Denmark the beginning of a series of foreign and domestic disturbances which culminated in the humiliation and dismemberment of the kingdom in 1864. The political drift of these years was irresistibly toward liberalism. The temper of the age became unfavorable to the mystical and retrospective in literature. Romanticism had done its work for Danish life and letters, and the rise of a new literary school that should look at the present and the future, and should occupy itself with the religious, social, and political problems that more and more agitate all classes in our day, was only a question of time. Two authors may be said to herald the new movement, even if they do not strictly belong to it: Parmo Carl Ploug (b. 1813), whose patriotic lyrics, chiefly of an occasional character, have given him a high place as a poet, and whose activity as the editor of the journal *Fædrelandet* (The Fatherland) and the untiring advocate of Scandinavian unity make him an important figure in Danish political history; and Meyer Aaron Goldschmidt (b. 1819), an able critic and satirical writer, but chiefly significant as the author of several masterpieces of prose fiction. Both Ploug and Goldschmidt, though representatives of advanced ideas, show clearly the influence of Romanticism in their strictly literary productions.

It was necessary that Denmark should be made acquainted with the latest tendencies in European thought and letters in order to bring the country into sympathy with what is called the modern spirit. This result was largely brought about by the efforts of Georg Brandes (b. 1840), the critic and literary historian, whose intellectual guides had been Hegel, Taine, Renan, and John Stuart Mill. In all respects a radical, possessing an unusual talent for popular exposition, and master of a fluent and eloquent if not always restrained and well-poised style, Brandes by his lectures and books has done more than any one else to turn Danish literature in the realistic direction to which it now seems to be committed. Candid judgment will discover that some of his ideals are flashy, and that the scope of his critical vision is often narrowest when it appears to be most extensive; but of the stimulus which he has given to Scandinavian letters there can be no question. Sweden and Norway felt this stimulus as well as Denmark, and the effect produced on Bjørnson and Ibsen has in turn reacted upon Danish writers. Drachmann, the most distinguished of the younger Danish school, is a writer of astounding fecundity, who, as a lyric poet and a novelist, stands perhaps in the very first rank of Danish literature. A crowd of smaller men, whose place it is too early yet to determine, have been even more subject to the domination of Brandes; among them may be mentioned Sophus Schandorph (b. 1834, a convert from Romanticism), J. P. Jacobsen (1847–87), Asbjørn Skram (b. 1847), Karl Gjellerup (b. 1857, who has revolted from the school of Brandes), Herman Bang (b. 1857), Edvard Brandes (b. 1847), and Gustav Esmann (b. 1860). The Romantic school is still represented among young writers by Ernst von der Recke and Rudolf Schmidt. The literary and scientific activity of Denmark, always remarkable when the small size of the country is taken into consideration, was never more noticeable than to-day. But the feeling of unrest which characterizes the last decades of the nineteenth century is too productive of self-consciousness to be altogether favorable to the development of a great modern school.

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Dan'ites, or **Destroying Angels**: a secret society of Mormons, organized in 1838, and originally comprising about 300 men, who are believed to have taken an oath to support the authority and execute the commands of the leaders of their sect at all hazards. Many massacres, robberies, and murders, committed during the early history of Utah, are ascribed to the Danites, but the Mormons themselves assert that these were not countenanced by the "saints." In 1877 John D. Lee, who had belonged to this society, was tried and executed for participation in the massacre of a train of "Gentile" emigrants in 1857.

Dankali: See Danakil.

Danks, Hart Pease: See the Appendix.

Dannat, William T.: figure-painter; b. at Hempstead, L. I., 1853. Pupil of Munich Academy and of Munkacsy, Paris; member of the International Art Jury, Paris Exposition, 1889; member of the Société Nationale des Beaux-Arts, Paris; member of the Society of American Artists, 1881. One of the ablest of American painters; many of his pictures depict scenes of life in Spain. His picture *A Quartette* (1884) is in the Metropolitan Museum, New York. Studio in Paris. William A. Coffin.

Dan'nebrog, or **Danebrog** [from Dan. *Danebrog*; *Dane* + *brog*, cloth]: the ancient battle standard of Denmark, bearing the figures of a cross and crown. It was fabled to have fallen from heaven at the battle of Volmar in Esthonia (1219) during a crusade against the heathens. It was twice taken in battle and twice recaptured. In 1500 a mere fragment remained.—The Order of the Dannebrog is the second of the Danish orders of knighthood. It is said to have been founded in 1219, but fell into decay, and was restored in 1671.

Dan'necker, Johann Heinrich, von: German sculptor; pupil of Pajou in Paris and of Canova (1785–90) in Italy; b. near Stuttgart, Oct. 15, 1758. Having returned to Stuttgart in 1790, he was appointed Professor of Sculpture. He produced busts of Schiller, Lavater, and other men of his time. While surpassed by Canova in creative power, he excelled him in æsthetic perception, and thus stands in the history of sculpture between Canova and Thorwaldsen. Among the best productions of the Canova classicism are his *Ariadne*, of which the original or a replica is in a private collection in Frankfort, the *Sappho* made for the Duke of Würtemberg, and a colossal statue of Christ. D. Dec. 8, 1841.

Dan'nevir'ke (Dane's work): a boundary-wall in Schleswig, built by the Danes against the Franks about 808, from the Baltic to the North Sea. The original line can be traced from the town of Schleswig to Hollingstedt. The line of the Dannevirke was restored in 1748 by a system of strong fortifications known as the "Great" and the "Little Dannevirke." They were evacuated by the Danes Feb. 5, 1864, and destroyed by the allies.

Dannhauer, daan'how-*er*, Konrad: theologian; b. in Breisgau, Baden, 1603. He studied theology at Marburg and Jena, and was appointed professor at Strassburg in 1628. He became known as one of the most ardent champions of Lutheran orthodoxy. Against the Romanists he wrote *Hodomoria Spiritus Papæ* and *Hyæna Friburgica*; against the Calvinists, *Hodomoria Spiritus Calviniani* and *Reformirte Salve*; and against the Syncretists, *Mysterium Syncretismi detecti*. He was the teacher of Spener, but had no influence on him. His *Katechismusmilch* consists of ten volumes in quarto. D. in Strassburg, 1666.

D'Annunzio, Gabriele: See the Appendix.

Dansville: railway junction, and the largest village of Livingston co., N. Y. (for location of county, see map of New York, ref. 5–D); situated at the head of the Genesee valley. It contains a sanatorium, union school, paper and pulp mills, mower and reaper works, chair-factory, woolen-mill, pail-factory, foundry, electric-light works, water-works, extensive nurseries, and vineyards. Pop. (1880) 3,625; (1890) 3,758; (1900) 3,633. Editor of "Advertiser."

Dantan, dăăn'tăăn', Joseph Édouard: genre-painter; b. in Paris, Aug. 26, 1848. Pupil of Pils and Lehmann. Second-class medal, Salon, 1840; first-class, Paris Exposition, 1889; Legion of Honor 1889. His *Corner of a Studio* was much talked of at the Salon of 1880, and is in the Luxembourg Gallery. The still-life in his pictures is remarkably well painted. Studio in Paris. W. A. C.

Dante Alighieri (or **Allighieri**), Ital. pron. daan'tā-ăă-lĕĕ-gĕĕ-ā'rĕĕ: the greatest of Italian poets and author of the *Divine Comedy*, one of the most famous of Italian and of all poems. The subject of Dante's life and works is an intricate one, and the number of treatises upon it already runs into the thousands. The limits of this article preclude the discussion of disputed points, and permit the statement of only what is now reasonably certain. For the sake of clearness it will be well to divide the matter into three portions—the first dealing with Dante's life; the second, with his spiritual history; the third, with his works.

I. Dante's Life.

The poet was born in Florence, in May or June, 1265. His father was Aldighiero (or Alighiero) degli Aldighieri, a lawyer by profession; his mother, Bella, of unknown but probably plebeian origin. The family was almost certainly not noble, and the attempts to connect it with the Frangipani and Elisei, supposably of Roman descent, are more than doubtful, and this in spite of the fact that they were early (perhaps by Dante himself: cf. *Inf.* xv. 70, *seq.*) believed to be well founded. The earliest known ancestor of the poet is his great-great-grandfather, Cacciaguida by name, mentioned by Dante (*Par.* xv. and xvi.). This Cacciaguida married a wife from the valley of the Po, an Aldighieri, probably from Ferrara. Hence came the poet's surname. One of the two sons of this marriage was Aldighiero; he had two sons—one named Bellincione; the latter had among four sons one named Aldighiero, who was the father of Dante. Little is known of the history of the family thus outlined. Dante makes Cacciaguida say that he followed the Emperor Conrad (probably Conrad III.) on his crusade (1147), was knighted by him, and perished by the hands of the infidels. The first Aldighiero is mentioned in a document of 1201, and is placed by Dante in Purgatory because of his pride. In the thirteenth century the family was strongly Guelph, and was twice (1249 and 1260) obliged to go into exile for its opinions. The fact that the latter exile ended only in 1267 has been thought to make doubtful the poet's birth in Florence; but this is clearly established by his own statement that he was "born and nurtured there till the culmination of his life." (*Conv.* i. 3.)

Of the boyhood of Dante we really know very little. There are plenty of fables about it, but they have no foundation in provable fact. An important event in his youth we do know—his love for a young girl of slightly less than his own years, who for centuries (until our own time, in fact) has been believed to be Beatrice, daughter of Folco Portinari. Of this matter, however, it will be better to speak in connection with Dante's spiritual history. Whoever the maiden was, she died young, as Dante himself tells us, June 9, 1290 (*Vita Nuova* xxx.), and this event produced a painful perturbation in his life. Still he had to fulfill his duties to the world in which he lived; and accordingly, after some years (probably toward 1295), he married Gemma, daughter of Manetto Donati. By her he had at least four children—Pietro, Jacopo, Beatrice, and Antonia. Four other names of children ascribed to him (Gabbriello, Aligero, Eliseo, Bernardo) appear; but the existence of these is doubtful. It has been supposed that the marriage was not a happy one, and in proof of this passages from the poet's works unfavorable to women, as well as statements of his early biographer, the novelist and romancer Boccaccio, have been adduced. This, however, is mere conjecture. The indubitable facts are that Dante nowhere speaks of his wife; and that after his exile (1302) she probably remained in Florence, being still alive there in 1332.

Dante was, however, not merely a lover, a husband, and a father. He took an eager part also in public affairs. Writing

about 100 years after Dante's death, his biographer Leonardo Bruni cites a letter of the poet in which he describes himself as having taken part with the Florentines in the battle of Campaldino, June 12, 1289. This letter, however, no longer exists, and Dante's contemporaries and immediate successors say nothing about the matter. A passage in his works (*Inf.* xxii., v. 1–9) has been taken to imply that he took part in the war of the Florentines against the Aretines in 1288; and he clearly informs us that he witnessed the capitulation of Caprona in Aug., 1289 (*Inf.* xxi. 94, *seq.*), though whether as a soldier he does not say. There is more that is certain in regard to Dante's connection with the internal affairs of Florence, though here also many legends have grown up, as, for instance, of the poet's numerous embassies to other states. As has been said, he belonged to a family traditionally Guelph, yet not noble: and as such he can hardly have looked with distaste upon the democratic movement which finally in 1293, by means of the famous Ordinances of Justice, compelled the old Ghibelline (and Guelph) nobility to enroll itself in the *Arti*, or guilds, on pain of loss of civil rights. He himself, probably at the prescribed age of thirty, enrolled in the Art of Physicians and Apothecaries. He at once began to hold public positions. In June, 1296, he was one of the Council of One Hundred, and he was still a member in Mar., 1297. In May, 1299, he was sent on an embassy to the commune of San Gemignano—the only sure one among fourteen reputed embassies. From June 15 to Aug. 15, 1300, he was one of the six priors of the republic. In 1301 he debated in both the aldermanic council (Consiglio delle Capitudini) and the Council of One Hundred. In April of the same year he was given charge of the widening and repairing of a street—the Via di San Procolo.

In the meantime events were shaping themselves, with and without the poet's co-operation, for the great catastrophe that was to affect more than all else his future life,—i. e. his exile. After 1293, despite the Ordinances of Justice, the turbulent nobles of Florence continued to disturb the life of the republic. The Ghibellines, as such, had mainly lost their power; but soon two parties appeared among the Guelphs—the one headed by the haughty Donati, the other by the rich but somewhat plebeian Cerchi. From 1300 these parties bore respectively the names of *Neri* (Blacks) and *Bianchi* (Whites), derived from a similar intestine fend of the neighboring city of Pistoia, in which the Florentines had interfered. The violence of the contest in Florence led the pope, Boniface VIII., to interpose. He took the side of the *Neri*, and intrigued vigorously for their and his own advantage. The *Bianchi*, however, had the upper hand in Florence; and early in 1300 three partisans of the *Neri*, also, it appears, emissaries of the pope, were condemned to heavy fines. This drew from the pope two haughty but vain letters to the Bishop of Florence, demanding the annulling of the decree (Apr. 24 and May 15, 1300). In June of the same year the *Neri* made direct application to the pope for help. He undertook to give it, sending Cardinal Acquasparta to Florence to bring about peace. The mission failed and Florence was excommunicated. Brawls continued to occur, and the priors determined to exile the heads of both parties. According to Dino Compagni (but the authenticity of his chronicle cannot be relied upon), the immediate occasion for this action was an outbreak on June 24, when Dante was one of the priors. From Villani's account, however, it would seem that the date was later, after Dante had given up his office. It is certain, however, that Dante inclined to the side of the *Bianchi*—that is, against the pope. It was not long before Boniface found another way to accomplish his purpose. On the advice of Corso Donati, it is said, he nominated Charles of Valois, brother of Philip the Fair of France, to be pacificator of Florence. Nov. 1, 1301, Charles of Valois, after solemn promises to the Florentines to respect their rights and fortunes, entered the city. Five days later he opened the gates to the Donati, who ravaged the quarters of their adversaries with fire and sword. Thus the *Neri* possessed themselves of the government, and determined upon a proscription of the *Bianchi*. Among the latter Dante was included. Jan. 27, 1302, he and his fellow-priors were accused "on public report" (i. e. the undisputed testimony of two witnesses) of extortion and barratry in office, besides other offenses. Dante was condemned to a fine of 5,000 small florins and other penalties. Forty days later (Mar. 10, 1302), for contumacy in not appearing and paying his fine, he was condemned to be burned, should he ever be found upon Florentine territory.

When and how Dante left Florence we do not know. Relying apparently upon a statement of Boccaccio that Dante was nominated by the *Bianchi* as head of a commission to go to Rome to protest to Boniface against the coming of Charles of Valois, Leonardo Bruni, in his *Life*, declared that Dante was in Rome when sentence was passed upon him, and first heard of the full extent of his misfortune at Siena, on his way home. The best authorities (e. g. Scartazzini and Bartoli) now agree, however, that this embassy is improbable. Dino Compagni, the suspected chronicler, alone of contemporaries mentions it, and many facts are against it. Boccaccio himself merely states that Dante was *nominated* to go to Rome; but declares that when condemned he left Florence secretly with Vieri de' Cerchi. At any rate, the poet went into exile, "to learn how salt is the taste of others' bread, how hard the ascent and descent of others' stairs" (*Parad.* xvii. 58, *seq.*). Whither he went is also in the main dark. He tells us himself that he journeyed, nearly a beggar, almost everywhere the Italian tongue was spoken, "showing against his will the wound of Fortune, which ofttimes is wont to be unjustly imputed to the wounded" (*Conv.* i. 3). The only contemporary statement, beyond his own hints, as to his movements is that of Giovanni Villani (*Cronica* ix. 136): *andossene allo studio a Bologna, e poi a Parigi, e in più parti del mondo.* Legends rapidly grew, and soon various places in Italy claimed the honor of his presence for at least a time. When we study the evidence, however, we find that we get only now and then a sure glimpse of him; then he disappears again from view.

It is worth while, nevertheless, to give briefly the story of his wanderings, in so far as it may be made out with reasonable certainty. From the passage in the *Paradiso* (xvii. 46, *seq.*), in which Cacciaguida is made to predict the sufferings that were to befall his great-great-grandson, it is clear that not long after his banishment the latter sought refuge in Verona, at the court of the Scaligers. This, Cacciaguida declared, should be Dante's *first* refuge and *first* resting-place. In spite of this apparently conclusive statement, however, it is probable that some months at least elapsed between the date of the poet's banishment and his resort to Verona; and that these months were spent by him, along with his fellow-exiles, in vain efforts to effect a return to Florence. His name appears, with the names of seventeen other Florentines, appended to a document drawn up at San Godenzo in the Upper Mugello, almost certainly of the date June 8, 1302. The document is an agreement on the part of the signers to make good any damage incurred by Ugolino Ubaldini, his sons, or others of his house, in an attempt to be made on the castle of Montaceianico, in the interest of the exiled *Bianchi*. The attempt was a success, though valueless as far as the ultimate purpose of the exiles was concerned. How long thereafter Dante remained with the exiles is very uncertain. It is certain, however, that, from whatever cause, he found himself as time went on in a state of growing indignation and rage against his own former friends, and at last he cut himself off from them and from all their projects. In the words of Cacciaguida (*l. c.*), he learned by experience the "course of their bestiality, so that it became well for him to have formed a party by himself." Whether this savage criticism was justified we know not; we know only that the affairs of the exiles went from bad to worse, and in 1304 met irretrievable shipwreck. And it is probable that before this date Dante had gone to Verona, to be kindly received by the "gran Lombardo," who almost certainly was Bartolommeo della Scala.

What the poet did at Verona is unknown, as indeed his means of livelihood through most of the years of his exile are unknown. It has been conjectured by several critics, most recently by Scartazzini (*Dante-Handbuch*, 1892, p. 122, *seq.*), that he made use of his great learning as a teacher. But this is highly uncertain, at any rate in the early years of his exile. Probably he did not long remain in Verona, for his patron there died Mar. 7, 1304, and was succeeded by his brother Alboin, of whom Dante in a well-known passage (*Conv.* iv. 16) speaks depreciatingly. Perhaps his oft-mentioned sojourn in Bologna fell in the years immediately succeeding this date; and perhaps, as Scartazzini has suggested, he was one of the Ghibellines driven out of Bologna by the Guelphs (Mar. 1, 1306), and went with others, notably several professors and scholars of the university, to Padua. He is mentioned in a document of Aug. 27, 1306, as dwelling in Padua. Apparently, however, he did not long abide there, for he appears in a document of Oct. 6,

1306, as intrusted by the Counts of Malaspina in the Lunigiana with the task of procuring peace between them and Antonio, Bishop of Luni, which task he satisfactorily accomplished. And now all certainty fails us for a considerable period. We do not know how long Dante remained in the Lunigiana, nor whither he went when he left it. It has been said on the authority of the fifteenth century writer, Flavio Biondo, that in 1308 he was in Forlì, employed as secretary by Scarpetta degli Ordelaffi. This may or may not be so. About this same year, 1308, the general drift of the evidence, rather than any definite fact, leads most authorities to place the poet's sojourn in Paris. The doubt, however, as to whether this visit ever took place seems ill-founded, seeing that we have the positive statement of Giovanni Villani (*l. c.*), confirmed by the unbroken tradition of the early biographers, from Boccaccio down, as to its reality. About what the poet did in Paris, whether he studied or taught, did or did not take a degree, and so on, we have no sure information. His supposed visit to Oxford, which rests upon a rhetorical passage in Boccaccio's Latin *Carmen in laudem Dantis*, and the statement of the fifteenth century commentator, Johannes de Serravalle, is, on the other hand, very improbable, to say the least.

If Dante was in Paris in 1308 or 1309, when did he return to Italy? Boccaccio says it was when Henry of Luxembourg (Henry VII.), the news of whose expedition had filled Dante with joy, was besieging Brescia. But this was in the summer and fall of 1311, and we have better evidence than Boccaccio's that Dante was already in Italy in the end of 1310. This is the famous letter addressed *Universis et singulis Italiæ regibus et senatoribus almae Urbis, nec non ducibus atque populis, humilis Italus Dantes Alegerii florentinus et exul immeritus orat pacem.* The letter is undated, but its character is such as to make it certain it was written soon after Henry's entrance into Italy (Oct., 1310). It is a pæan, a hymn of congratulation and joy, addressed to all Italy on the coming of its deliverer. It begins: *Ecce nunc tempus acceptabile, quo signa surgunt consolationis et pacis.* It ends: *Hic est quem Petrus, Dei Vicarius, honorificare nos monet; quem Clemens, nunc Petri successor, luce apostolicae benedictionis illuminat; ut ubi radius spiritualis non sufficit, ibi splendor minoris luminaris illustret.* The patriot welcomes the restorer of peace to his fatherland; the Ghibelline, the new representative of the Holy Roman Empire; the idealist in thought, the idealist in practice. On Mar. 31, 1311, the poet wrote to the citizens of Florence, *scelestissimis Florentinis*, a letter full of bitter exultation at the pains they were soon to endure; and he must have been on the borders of Tuscany when he composed it. (*Scriptum prid. Kal. Aprilis in finibus Tusciae sub fontem Sarni, faustissimi cursus Henrici Cæsaris ad Italian anno primo.*) On Apr. 16, 1311, from the same place he directed a third letter to Henry himself (*Sanctissimo Triumphatori et Domino singulari*), in which he urged him to leave for the time the rebellious cities north of the Apennines, and to hasten to the punishment of Florence—*vipera versa in viscera genetricis.* From an expression in this letter it seems clear that Dante had sometime previously seen and done homage to Henry, but when or where we do not know. Nor do we know the fortunes of Dante in the years immediately succeeding. The disappointment of his eager hopes and dreams is of course clear. Henry's death at Buonconvento, Aug. 24, 1313, destroyed them all. No report tells us where Dante was when this catastrophe occurred, nor how he bore it; but of the latter we can judge from the solemn and bitter words of Beatrice, the last she speaks to the poet (*Par.* xxx. 133, *seq.*), as she points out to him in the circle of the celestial rose the great seat already crowned that awaits "the high Henry, who, to set Italy straight, will come ere she is ready." One more point is clear, i. e. that Dante's bitterness against Florence had confirmed his exile. Under pressure of the impending attack of Henry, the city had recalled (Apr. and Sept., 1311) many of her banished sons; but in the list of those excluded from the benefits of Baldo d'Aguglione's *riforma* stands the name of Dante. And this exclusion is again confirmed in a decree of Nov. 6, 1315, but with the addition this time of the poet's sons. It is not probable that this attitude of the city toward her greatest citizen was changed during his life. A passage in Boccaccio's *Life of Dante* (pp. 53–54), to be sure, apparently confirmed by a magnificent letter of Dante to a Florentine friend, has led many to believe that the poet was in 1316 given an opportunity to return on certain humiliating conditions, but refused indignantly to accept the same. The letter, however, exists in but a single and in many ways perplexing manuscript (*Laurent.* xxix. 8), and is in other respects suspicious, so that little confidence can be felt in its authenticity.

The truth is that from Nov. 6, 1315, until the year of Dante's death, we have not a single really certain date. In the statements as to his abiding-places and occupations we are sure there is much that is fabulous, though undoubtedly something that is true. To draw the line with confidence between the two is well-nigh hopeless. Boccaccio tells us that after the death of Henry VII. Dante went across the Apennines into the Romagna, and was received by Guido Novello da Polenta, "at that time lord of Ravenna," and entertained by him for several years. Alas! in 1313–14 Guido Novello was *not* lord of Ravenna, only *podestà* of Cesena. So the whole statement becomes suspicious. Nor is it made less so by the letter in Italian, first published by Anton Francesco Doni in 1547, in which, under date Mar. 30, 1314 (or 1313, for there is trouble over this), Dante purports to write to Guido Novello from Venice an account of an embassy undertaken by him for the latter to the Venetians. It is a strange letter, and there are things in it (e. g. that the Venetians have been unable to understand the Latin of diplomacy) that can only be said to be inexplicable. Perhaps the best thing is to call it outright a forgery. The forger, whoever he was, was very clumsy, for he was trying to connect his falsification with an event the true date of which Giovanni Villani gives us—an embassy of Dante to Venice in 1321.

We can not be sure, then, that immediately after Henry's death Dante went from Tuscany to the Romagna. Guido Novello became lord of Ravenna after the death of his uncle Lamberto, June 22, 1316. It is possible, perhaps even probable, that soon after this date Dante first received the aid and protection of the man who undoubtedly made his life less hard at its very end. It is not likely, however, that the poet resided constantly at Ravenna through all these years. Indeed, we know that now and again (though the precise dates we do not know) he was elsewhere. We need not discuss the long list of uncertain places with which local pride or critical ingenuity has striven to connect the poet's name. Each has its shade of probability or improbability, but it would require a volume to determine it in every case. We shall simply pass over Pisa, Gubbio, Fonte Avellana, Udine, and the rest. In two cities, however, Lucca and Verona, it is practically certain that Dante sometime during these years was, and in both cases the certainty arises from Dante's own words.

In the twenty-fourth book of the *Purgatorio* (v. 34, *seq.*) Dante represents himself as conversing with Bonagiunta, a poet of Lucca, and as being told by him, among other things, that a maiden is already born (by name Gentucca) "who shall make pleasant his city to him, however men may blame it." Clearly when Dante wrote those words he has been in Lucca, and had known the delicate kindness of Gentucca. But when? Troya, basing his argument upon his identification of Dante's Veltro (*Inf.* i. 101), with Uguccione della Faggiuola, tells us that the date must have been later than 1314, for in that year only did Lucca fall into Uguccione's power, having before that been absolutely closed to Ghibelline or *Bianco* (hence to Dante). Here, however, all is conjecture. We can only say that the date as a *terminus a quo* has probability on other grounds also.

And now for Verona. We have already seen that a passage in the *Paradiso* (xvii. 70, *seq.*) proves that Dante was in Verona not long after his exile, and enjoyed the hospitality of Bartolommeo della Scala. The same passage further on proves that at a later date he was in Verona and received the kindly aid of Bartolommeo's younger brother, Can Grande della Scala, who became lord of Verona in 1312. Here again we do not know the date, but it was probably after 1316. Of the intimacy between the poet and Can Grande the best evidence is the famous dedicatory letter to the latter, expounding the true intent of the *Divina Commedia*, which, in spite of all the attacks of the critics, seems still to remain probably authentic. Less fortunate, however, is the attempt to prove that Dante was in Verona in 1320 upon the authority of the treatise *Quaestio de duobus elementis aquae et terrae*; for this treatise is almost certainly a fabrication of a later time.

In the year 1321 (but, let us repeat, how long before that we do not know) Dante was certainly in Ravenna, at the court of Guido Novello da Polenta. In that year

he went on an embassy for the latter to Venice (cf. G. Villani, *Cron.* ix. 136), and upon his return from the same he died, Sept. 14, 1321. "And," says Villani, "in Ravenna, before the door of the greater church (San Pier Maggiore), he was buried with great honor, in the garb of a poet and great philosopher." Yet even in death the weary exile was not to have peace. It would be too long a story to rehearse here the vicissitudes of his mortal remains—the long series of frustrated or but half-fulfilled plans of magnificent preservation and commemoration; the efforts of fanatic churchmen to bring ignominy even upon death; the bickerings of Florence and Ravenna over the possession of the precious relics; the disappearance of these from their sarcophagus just before they were to be given over to Florence (Oct. 20, 1519); their rediscovery, May 27, 1865, by the master mason Pio Feletti, as he was tearing down a wall in the old Franciscan monastery that stands close by San Pier Maggiore; the consequent jubilation of all Italy. The story can be found in every detail in the work by Ricci, mentioned below.

II. Dante's Spiritual History.

Of all poets Dante has most clearly and unmistakably given form and pressure to his own experience, his own ideals, his own aspirations. As we study his works we grow more and more convinced that they are understandable only if we comprehend something of the course of his own inner life. And yet this comprehension is in many ways hard to attain, and the confusion of opinion we have found in regard to his external life prevails even more here. Still it is useful and even necessary to indicate what lines seem in the main to have established themselves. We must speak briefly of his education; of the beginnings of his individual experience; of the phases of thought and belief through which he passed.

We do not know at what schools or under what masters Dante received his early education. Undoubtedly this education took the regular mediæval form of the *trivium* and *quadrivium*, for the poet knows no other scheme of instruction (cf. *Conv.* ii. 14). A tradition, beginning as early as the fourteenth century, represents him as having been taught by Brunetto Latini, and this has been thought to be confirmed by the beautiful words addressed by the poet to the latter (*Inf.* xv. 82, *seq.*):

> Chè in la mente m'è fitta, ed or mi accora
> La cara e buona imagine paterna
> Di voi, quando nel mondo ad ora ad ora
> M'insegnavate come l'uom s'eterna.

These words, however, seem hardly to imply the relation of master to pupil; and on other grounds it is improbable. Brunetto had indeed during his long exile in France become a man of universal learning, as his *Trésor* shows; and he was, in the words of Giovanni Villani (*Cron.* viii. 10), *sommo maestro in rettorica*, as well as *cominciatore e maestro in digrossare i Fiorentini, e fargli scorti in bene parlare, e in sapere guidare e reggere la nostra republica secondo la politica.* But in Florence he was fully occupied till his death (1294) with great public concerns, and certainly can not have given systematic instruction to Florentine youth. Still his influence upon Dante and the group of young men to which Dante belonged is undeniable; and it may well have been under his inspiration that the poet laid the foundation of that learning which subsequently made Villani say of him: *Questi fu grande letterato quasi in ogni scienza, tutto fosse laico.* This learning, as we see it in Dante's works, was naturally the result of the toil of a lifetime, not of youth only. Before his death it embraced practically all that a man of his time and country could know. He was deeply versed in many literatures—Latin (both classical and mediæval), Provençal, Old French, Early Italian—but not in Greek, Hebrew, or Arabic. He was an eager student of philosophy. He was acquainted with most of the mathematical and physical science of his age. He knew something of music and painting. Yet he was never a scholar for the sake of scholarship. All he knew he used for his own purposes, not subordinating himself to it and becoming lost in it.

More important than the history of Dante's learning is that of his imaginative life. It is probable that with him the impulse to imaginative expression and the beginnings of imaginative experience were contemporaneous. The former, perhaps, arose from the example of those poets, somewhat older than himself, who were giving to Italian poetry a meaning independent of the Provençal tradition—the poets of the *dolce stil nuovo.* The change had been begun by the Bolognese Guido Guinicelli, who died while Dante was yet a child (1276), but whose influence the latter recognizes when he calls him (*Purg.* xxvi. 97):

> il padre
> Mio e degli altri miei miglior, che mai
> Rime d'amore usâr dolci e leggiadre.

From Bologna, however, the "sweet new style" had passed over the Apennines into Tuscany; and there in Dante's boyhood it was practiced by a whole group of poets, the most prominent among whom were Lapo Gianni, Dino Frescobaldi, Cino da Pistoia, and Guido Cavalcanti. Side by side with these were poets of the older "Provençalizing" school, such as Dante da Majano, Guittone d'Arezzo, Guido Orlandi, and others. Hence much poetical discussion and some sharp mutual criticism. Whether these poets belonged to the old or the new school, however, their subject was the same—namely, love. This was the theme which the poets of Provence had set, and it was not departed from essentially. Dante himself at first writes about nothing else. To the poets of Provence, however, love was essentially a social function—the service of noble and beautiful women for the sake of knightly perfection and renown. The Italian poets of the "sweet new style" began to identify the service of love with the service of all spiritual ideals, making of the particular woman served rather the incarnation of these ideals than a person to be humanly admired and sought. And this identification was carried by Dante to its utmost point, until in him we find the whole higher life, intellectual, moral, and imaginative, conceived in terms of love and the service of woman.

Early touched by this poetical theorizing, and thoroughly imbued with the doctrine that capacity to love is the one unmistakable mark of the gentle heart, Dante's imaginative preoccupation soon found an object, a center about which to gather itself. This object was the woman whose name is forever consecrated in the poet's works, Beatrice. About her, whoever she was, the whole spiritual life of Dante afterward revolved. To his early love for her his *Vita Nuova* is dedicated; to the history of his later regeneration through and by her his *Divine Comedy* is devoted. And yet, despite the fame she has thus attained, she remains for us remote, uncertain, dim. Putting aside the manifestly romantic account of Boccaccio, we know nothing about her except what the poet tells us; and to him she became more and more simply the incarnation of his own higher nature, so that his words about her are full of difficulties and seeming impossibilities. Indeed, there have been those who have denied that she was a real woman at all; and elaborate theories have been constructed to prove that she was only an ideal creature of Dante's own spirit.

If, however, we take what appears on the face of Dante's words, Beatrice was a Florentine maiden, nearly a year younger than himself, who, toward the end of his ninth year, first attracted his attention and stirred in him the impulse to love. From the time when he first saw her he admired and sought her; and finally, after nine years more, she bestowed upon him a greeting that made him firmly her own. Thenceforward his mind and imagination were absorbed in devotion to her, and he began to compose poems in her honor, which he communicated to other poets, drawing replies from them. For a time he concealed the identity of his real mistress by seeming to serve another lady (*la donna della difesa*); but at last, finding that this was causing comment, and having on one occasion been overcome by his emotions in a company where Beatrice was present, he told his secret to a friend, and soon it had become common property. Though knowing that his suit could yield him nothing but at the most a greeting and the pleasure of speaking and writing about the lady he loved, he yet continued to celebrate her, until on June 9, 1290, she died, leaving him in great pain and grief.

Dante distinctly says (*V. N.* xviii.) that "many persons had learned the secret of his heart." Yet it was reserved for Boccaccio, in his *Life of Dante*, to state who Beatrice was. According to him, she was the daughter of Folco Portinari, a highly esteemed Florentine citizen and a neighbor of Dante's parents. There has been preserved to us the will of this Folco Portinari, dated Jan. 15, 1288; and in it we find it stated that his daughter Beatrice was already at that time wife of a certain Simone dei Bardi. The tradition given by Boccaccio has been generally accepted by Dante's biographers from the fourteenth to the nineteenth century, and very recently an important confirma-

tion of it has been discovered. It is the statement of Dante's own son Pietro that his father's mistress really was Beatrice Portinari. (See Luigi Rocca. *Del Comm. di Pietro di Dante cont. nel Cod. Ashburn.* 841, published in the *Giorn. Stor. della Letter. Ital.* vii. 3.) Yet so strange and unreal is Dante's account of his love in the *Vita Nuova* that, as has already been said, there are those who altogether deny the identification of Boccaccio, and some who refuse to Beatrice real existence at all. As early as the fifteenth century Filelfo declared Beatrice to be only a creature of Dante's imagination; in the eighteenth century Biscioni undertook to prove her a personification of Wisdom (*Sapienza*). In the nineteenth, Gabriel Rossetti has believed her to represent the Holy Roman Empire; Perez, the Active Intelligence; Bartoli, woman in general. Others, the latest perhaps Scartazzini, have admitted her reality, but denied that she was Beatrice Portinari. These theories can not be discussed here, but it may be said briefly that a mere personification could hardly be born in a certain year, go into companies, talk over the poet mockingly with other ladies, live in a street in the middle of the city, and die June 9, 1290. And if Beatrice really lived, no argument that has been yet advanced seems sufficient to overthrow the tradition, beginning with Boccaccio and Pietro di Dante, that she was Beatrice Portinari.

While Beatrice lived she at once engaged Dante's heart and stirred his imagination. By reason of her he wrote various poems that gave him a place among the best poets of his time. When she died he meant still to serve her, and meditated songs in her honor. But there came perturbations in his life. He found it hard to keep true to Beatrice's memory. He swerved in his allegiance, exactly how we do not know, though we are sure of the fact, because in *Purgatorio* xxx.–xxxi. Beatrice sharply reproves him for his faithlessness, and he admits the justice of her words. Moreover, his lapse attracted the attention of his friends. Guido Cavalcanti in particular sent him a sonnet full of bitter blame (*I' vegno 'l giorno a te 'nfinite volte, e trovoti pensar troppo vilmente*, etc.). It is probable that Dante's faults at this time were both moral and intellectual. Boccaccio has left us the hint that the poet had not always control over his passions; and, although this statement has been again and again indignantly denied, it seems to be borne out by certain words of the poet himself (cf. *Purg.* xxiii. 115; xxvii. 46; xxxi. 58; and the sonnets to Forese Donati). But, besides moral aberrations there were also spiritual. This too we know on Dante's own authority. In the *Vita Nuova* itself he has told us how, some time after Beatrice's death, a certain piteous lady (*Donna Pietosa*) came to exercise over him an attraction so great as almost to drive Beatrice from his mind. And in the *Convivio* he tells us who this lady was. She was Philosophy, to whom he turned first for comfort, but whom he soon came to believe a better mistress than any woman could be. Indeed, his powerful imagination, taking a hint, perhaps, from the *De Consolatione Philosophiae* of Boethius (one of the books, as he tells us, from which his passion for philosophy arose), gave form and personality to this new mistress, and he could think of her in truly amorous terms. For several years he tried to live by the service of Philosophy, and there have been some to think that he inclined at this time to the doctrines of those skeptical and worldly thinkers, then somewhat numerous in Florence, whom he himself called Epicureans. This is, however, improbable. There is no evidence in any of Dante's works that he ever ceased to be thoroughly a Catholic Christian, ever doubted the immortality of the soul, or otherwise shared the unbeliefs of his time. What is more probable is that in a self-confident and headstrong way, with too little of humble faith, he strove to penetrate the mysteries of the universe and God. He tells us himself that he was guilty of the sin of pride (*Purg.* xiii. 136, *seq.*); and his contemporary Giovanni Villani says of him (*Cron.* ix. 136): "*Dante per lo suo savere fu alquanto presuntuoso e schifo e isdegnoso, e quasi a guisa di filosofo mal grazioso non sapea conversare co' laici.*" We are led, therefore, by the general drift of Dante's own words of confession to imagine him, after Beatrice's death, in a somewhat reckless and perturbed state of mind, seeking relief in eager studies, and joining with other young men (perhaps Guido Cavalcanti among them), who, though not unbelievers or Epicureans, had not preserved an attitude of humble faith. This was that "school" which Beatrice charged Dante with having followed (*Purg.* xxxiii. 85), adding that "his way had been as far distant from the divine way as is distant from earth the heaven that highest hastes."

Something feverish and uncontrolled, then, there was about these years of Dante's life. And one can not help feeling that this appears in other ways than those already mentioned. For instance, in spite of the great talents that from the start gave him influence and power, no man was ever really less fitted for political life than Dante. Passionate, proud, unwilling to yield or accommodate himself to others, he can have obtained only pain from mingling in public affairs. Yet this very time was when he was beginning to take part in the bitter struggles of Florence. Then, too, it is improbable that Boccaccio's story of Dante's marriage, as arranged by his relatives in order to distract his mind, though manifestly in many respects mere romancing, is totally devoid of foundation in fact. One can not help thinking that here too the poet showed the effects of a disturbed and uncontrolled mind. Fiercely studying, haughtily insisting on his own learning and superior wisdom, hastily mingling in public affairs, recklessly marrying, he appears to us as one going through a phase of experience probably inevitable and also profitable to him, yet such as later to cause him bitter regrets.

It was, however, only a phase. Dante's passionate spirit speedily ran through the alluring assuagements of grief and found them empty. And then his imagination began once more to turn to its old object. Beatrice was dead; but even so she was superior to any living interest, and the service of her was the service of all eternal and spiritual things. Gradually the thought of her became the all-absorbing thought, and the whole higher nature of the man found its ideal object in her. He conceived her as watching over him, even from heaven, and as finally effecting his conversion from error and sin. The story of this conversion is told in the *Divine Comedy*; and there the time of Beatrice's effective interposition in his life is put in the jubilee year 1300, the thirty-fifth year of his own age. In the *Vita Nuova*, however, which was certainly, in greater part at least, composed before 1300, Beatrice is made already to have resumed her sway; and, indeed, that work ends with the expressed hope of the poet "to say of her what was never said of any woman." It must be then that, during the last years of the thirteenth century, Dante was more and more clearly finding out the true meaning of the service of Beatrice; and that from 1300 he fully saw that this was the fulfilling of his own higher nature—the aspiration and the effort for wisdom, for righteousness, for the grace of God.

And this remained to the end Dante's conviction. No other great change came over his spirit. We do not know, of course, the exact history of his inner life during his long exile. We can imagine that he was a weary-souled and sorrowful man. As far as this world goes he probably longed most of all for the end—for peace. This is a favorite word of his, and the story of Fra Ilario * would confirm this view, if we could trust the letter bearing his name. Yet Dante had become a citizen of the eternal world, of the city of God, and in the light of that he viewed the happenings of our lesser sphere. A sad place this seemed to him, but fortunately temporary. At the very end of his life, it may be, he knew some relief from his prevailing melancholy. At the court of Guido Novello at Ravenna he had, at last, respect and quiet; and if we could be sure of the authenticity of the Latin eclogues that purport to have been exchanged between him and Giovanni del Virgilio, we could say positively that he became, before he died, calm, and even at times glad of heart. But there is great uncertainty here, and we can only leave him, as we see him last, a servant of Beatrice and, through her, of God.

III. Dante's Works.

1. The Vita Nuova.—This, the earliest of Dante's works, whose purpose has been already described, consists of a series of sonnets and canzoni, accompanied by a comment in prose. The poems were written before the comment, and the latter serves to bind them together into an account of

* The famous Latin letter purporting to have been written by Frater Hilarius, a monk of Corvo in the Lunigiana, to Uguccione della Faggiuola, was first printed by Mehus in his *Latinae Epistolae et Vita Ambrosii Traversari*, 1759. It is to be found, among other places, in Fraticelli, *Vita di Dante*, 1861, p. 357, *seq.* The story mentioned in the text is the following: *Ecce igitur, quod cum iste homo* [Dante] *ad partes ultramontanas ire intenderet, et per lunensem diœcesim transitum faceret, sive loci devotione, sive alia causa motus, ad loeum monasterii supradicti* [Corvo] *se transtulit. Quem ego eum viderem adhue et mihi et aliis fratribus meis ignotum, interrogavi quid peteret; et eum ipse verbum non redderet, sed loci tamen constructionem inspiceret, iterum interrogavi quid peteret. Tunc ille, circumspectis mecum fratribus, dixit—Paeem.*

the poet's early love. The completed whole, however, is rather imaginative than historic in character—*Dichtung und Wahrheit* in proportions hard to determine. The date of final composition is very uncertain—critics having varied in opinion from 1290 to 1314 (!). Dante's own statement (*Conv.* i. 1) is that he wrote the work *dinanzi all' entrata di mia gioventute*. If the word *gioventute* is here used rigidly, as the poet elsewhere uses it (cf. *Conv.* xxiv.), we should have the date 1290. But the book contains an allusion to the date June 9, 1291 (*V. N.* xxxv.), and to events subsequent to this. Guido Cavalcanti's sonnet, already cited, seems also to imply some delay in the fulfillment of Dante's purpose after Beatrice's death to collect his poems about her into a book. It is safest, therefore, to suppose that Dante, when beginning to recover from the distractions of his period of recent loss, and to return to the thought of Beatrice, carried out a plan earlier conceived, and produced the *Vita Nuova*. This would give us the approximate date 1294 or 1295. One thing is clear, i. e. that the *Vita Nuova* stands in essential connection with the *Convivio* and the *Divina Commedia*. It is, in short, the first member of what Witte has admirably called a *trilogy*.

2. The Convivio, or Convito.—One main purpose of this work (cf. *Conv.* ii. 13, 16; iii. 1) was to set right those persons who, misreading Dante's words about the *Donna Pietosa* in the *Vita Nuova*, had blamed him for changing his love. This piteous lady was no earthly creature, says Dante, but *Philosophy* (*per mia donna intendo sempre quella che nella precedente Canzone è ragionata, cioè la Filosofia, quella luce virtuosissima*, etc., *Conv.* iv. 1). Besides this object, however, Dante had another, namely, to present to ignorant and erring men a rich banquet (*Convivio*) of reason, by partaking of which they should be encouraged to noble virtues, and redeemed from the brutality of the common herd. In order to attain this end Dante thought to publish fourteen of his own canzoni—*sì di amore, come di virtù materiate*—accompanying them with an exposition in prose. For some reason he completed his comment on three poems only; and to the three *Trattati* thus obtained he prefixed a general introduction. The work is therefore only a fragment; but it is very precious to the student of the *Divine Comedy*, because it contains innumerable hints and explanations of Dante's conception of philosophy, of morals, and of art. The date of composition has to be fixed by conjecture from internal evidence; but it seems probable that the three canzoni expounded were written between 1295 and 1299, and that the comment was begun before 1300, but not completed as we have it until 1306–08. The work is essentially an expression of the period in Dante's life when he was giving special attention to philosophy; yet it seems, as one reads, as if, when the finishing touches were given, the exclusive cult of philosophy were only a reminiscence, and the fusion of philosophy with faith, both realized in Beatrice, were already complete. It can not be too much insisted upon that to the end Dante never rejected philosophy; he simply put it by the side of faith, as useless and misehievous without the light of that.

3. The Divina Commedia.—Already when he was writing the *Vita Nuova* Dante had begun to busy his imagination with a great poetical project in honor of Beatrice (cf. *V. N.* xliii.), and this project had probably taken on somewhat the form of the later *Divine Comedy* (*V. N.* xix.). That is, in order the better to show the true character of Beatrice's interposition in his own life, Dante had conceived of an imaginative account of the human soul in its universal and eternal life, as determined, however, by the character of its life on earth. In this wise he could both express his devotion and gratitude toward her, who had come to be the incarnation of his own higher self, and also make clear to his fellow-men the true character of their relation to the universe and God. In form the account should be a vision, similar to many visions that had been written both in the ancient and in the mediæval world (cf A. d'Ancona, *I Precursori di Dante*, Florence, 1874), but described with the immeasurably greater clearness and tangibility that Dante's genius made possible. Thus, by means of a similitude, the inner nature of things should be set forth. Such a scheme permitted not merely a literal description of the unseen world, but all kinds of adumbrations of all kinds of truth. Dante was thoroughly imbued with that theory of the fourfold meaning of all great literary works which the most ardent spirits of the Middle Ages held. He set it forth in his *Convivio* (ii. 1), declaring that what is written must be expounded (1) literally, (2) allegorically, (3) morally or ethically, (4) anagogically, or spiritually. And later, in his letter to Can Grande della Scala, he definitely applied it to his own great poem (*Ep. ad Can Grandem*, vii.). Writing with such a plan and purpose in his mind he naturally filled his work with mystical and difficult meanings. The mere use of numbers illustrates this. To Dante three, nine, and ten had a peculiar significance, and are made to appear everywhere in the structure of the spiritual world. The whole poem has 100 cantos—the *Hell* 33, with an introductory canto, the *Purgatory* and the *Paradise* each 33. And in all manner of other ways the same thing appears. So the student is everywhere met by possibilities of a meaning that does not show itself in the mere words.

It would be too long a task to give a complete account of the form and matter of the *Divine Comedy*. Suffice it to say that Dante represents himself as conducted, to the end that he may be saved from his own life of error and sin (cf. *Purg.* xxx. 136, *seq.*), through the Hell, to which are condemned those who on earth knew not Christ, or, knowing him, persistently refused to live according to his law; through the Purgatory, in which are purified those sinners whose sin was not mortal; and through the Paradise, in which the righteous have the fruition of their earthly endeavors, and enjoy to all eternity the light and the love of God. Through Hell and Purgatory human reason, moved by the grace of God as communicated through Beatrice, suffices as a guide; but human reason as summed up and incarnate in that poet of the ancient world whom Dante most loved and admired—Vergil (cf. D. Comparetti, *Virgilio nel medio evo*, 2 vols., Leghorn, 1872). But human reason does not suffice for Paradise; here faith and divine grace are necessary. And these are for Dante always and everywhere embodied in Beatrice. She guides him through the spheres where the just reside, until at last she delivers him over to that mediæval saint—Bernard—whose devotion to the Virgin had made him the most fit to display to the soul made perfect by the service of what is eternal in woman, the final absorption of the redeemed into the thought of God.

The structure and arrangement of Hell and Purgatory are determined by the scheme of human sins that rose in Dante's mind, as in that of his contemporaries, as needing punishment or purification. There are some apparent contradictions between the Inferno and the Purgatory, which have given rise to almost endless discussions. We can not go into these here. It is enough to say that down through the circles of concave Hell, and up over the ledges of the Mount of Purgation, Dante and his guide pass in review all forms of human misery and guilt. And it is real misery and guilt—that of men whom Dante and every Italian knew or knew about. The poet's inflexible spirit spares none who have deserved ill of God. In no work of the human imagination has the actual world been laid under such large contribution. When, however, we pass from Purgatory to Paradise we find ourselves no longer in a universe of time and space, but rather in the universe as it is the mind of God. That is what salvation is—participation in the life and thought of God. Time and space remain only as appearances. That poetic conception of the universe known as the Ptolemaic astronomy gave Dante the idea of rendering the eternal world, on one side and in one aspect, as formulated in a series of concentric spheres, nine in number, all contained with the highest heaven, the Empyrean. Of these spheres, seven were presided over and named from the seven planets: the eighth was the heaven of the fixed stars; the ninth that crystalline heaven, the *Primum Mobile*, which, by its eternal desire to unite itself with the Empyrean, acquires an inconceivably swift motion, communicating this to the crystalline heaven, and thence to all the heavens and to all things that have life and motion. And in these successive spheres, according as has been the nature and the degree of their merit, the spirits of the redeemed manifest themselves. But not eternally or exclusively so. As redeemed, they all live in the light of God's countenance; and as complete and immortal personalities they have their place in his thought. And this thought of God, in so far as it contains the redeemed, Dante conceived as best described in the form of a mystic rose, whose petals, row upon row, are the seats of the blessed, and whose yellow center is the flame of the love of God. And when Dante has seen this in his vision, and has faced the splendor of the Godhead itself, he begins to feel his own will and desires absorbed into the will of God—at last in harmony with the universe, and revolving, as that revolves, through

L'Amor che muove il sole e l'altre stelle.

The composition of the *Divine Comedy* probably occupied all the last years of Dante's life. If Boccaccio's story of the finding of the first seven cantos of the *Inferno* in Florence after the poet's exile be true, he must have begun to write it before that event took place. But undoubtedly what he wrote then was worked over again before it saw the light. There may be some truth also in Boccaccio's tale about the disappearance and curious rediscovery of the last cantos of the *Paradiso* after the poet's death. The numerous allusions to contemporary persons and events which the poem contains afford a considerable amount of light as to when the various portions of the work were in Dante's hands. But these same allusions are also somewhat confusing at times, and have given rise to great divergences of opinion. One thing is clear, i. e. that immediately after Dante's death his work was received with universal acclamation in Italy. It was not called *Divine* perhaps until early in the sixteenth century, but its pre-eminence over all other Italian poems was long before that fully established.

4. Il Canzoniere.—Besides the poems included in the *Vita Nuova* and the *Convivio*, a number of lyrical poems bearing Dante's name have survived. Some of these are undoubtedly spurious; of some it is hard to determine whether they are genuine or not. The question is made more difficult and also more important by the fact that among them are productions of a character greatly at variance with the larger works of Dante. Such are the coarse sonnets to Forese Donati, which have often been rejected by lovers of Dante, but which many of the best scholars now admit to be genuine.

5. The De Vulgari Eloquentia, or Eloquio.—This Latin treatise, though, like the *Convivio*, only a fragment, has peculiar interest both as containing Dante's maturest views on the subject of his native tongue, and as being the very earliest critical work we have upon the Romance languages. It arose from the eager discussion in the poet's time as to whether a serious writer could venture to use any language but Latin. Dante was naturally deeply interested in the question, because he had written or was to write his greatest works in the vulgar speech. He discussed it in the introduction to the *Convivio*, and there stated (*Conv.* i. 5) his intention of writing a book about it. Just how soon he partially carried this out is uncertain; Boccaccio says it was when he was already near the end of his life, but this is a loose statement. It is more probable that the treatise was undertaken in 1309 or 1310. The work contains some of Dante's noblest words (e. g. *Nos autem cui mundus est patria, velut piscibus æquor*, etc., cap. vi.), and delightfully indicates his final conviction—not that of his earlier years (cf. *V. N.* xxv.; *Conv.* i. 5)—that a man's native speech is, after all, the noblest and best (*Vulg. Eloq.* i. 1).

6. The De Monarchia.—When Dante felt his political convictions to be mature, and his judgment valuable through experience, he undertook to discuss in Latin, and after the most rigid dialectical method of his time, the nature and meaning of the great institution whose incompatibility with the pretensions of the Church gave rise to all the larger political troubles of the Middle Ages; i. e. the Roman empire. And in particular he undertook to answer in three books three questions concerning the empire (*De Mon.* i. 2): 1. *Whether it was necessary for the welfare of the world.* 2. *Whether the Roman people took to itself by right the office of monarchy or empire.* 3. *Whether the authority of monarchy comes from God directly, or only from some other minister or vicar of God.* Evidently the third of these questions was the critical one, considering the period in which Dante lived. His answer to it was that the authority of the empire came directly from God, and not from God through the Church. The two institutions were parallel, neither owing obedience to the other. And yet it behooved the political and temporal power to show respect and deference for the spiritual (*De Mon.* iii. 15). There is difficulty in determining the date of the treatise, some critics (among them Witte) believing that the absence of any mention of Dante's exile proves that it was written before 1302. Others, however, relying on the pronouncedly Ghibelline character of the opinions expressed, believe it to belong to a later time. Thus Scartazzini (*Dante-Handbuch*, p. 340, *seq.*) follows Boccaccio, and connects it with Henry VII.'s expedition into Italy. This seems in all respects the most probable view.

7. The Letters.—The most important of these letters have already been spoken of in connection with Dante's life. Mr. C. S. Latham's *Translation of Dante's Eleven Letters, with Explanatory Notes, etc.* (Boston, 1891), contains full information about them.

8. Doubtful or Spurious Works.—(1) Least doubtful among the works attributed without certainty to Dante are the two *Latin Eclogues* addressed to Giovanni del Virgilio (see above). They are mentioned by Boccaccio and Bruni, and were commented by an anonymous commentator of the fourteenth century. Still, strong objections have been made to them, from which they are not yet altogether redeemed (cf. the article by Paul Meyer, in *Romania*, 1882, p. 325, *seq.*). (2) Almost certainly spurious are the *Sette Salmi penitenziali* and the *Credo* (*trasportati alla volgar poesia da Dante Alighieri*). (3) Spurious also is the so-called *Quæstio de Aqua et Terra* (the full title is much longer). This treatise, which purports to give the substance of a public disputation held by Dante in Verona, Jan. 20, 1320, was first published in Venice in 1508, by a certain Joannes Benedictus Mancettus de Castilione Arretino, as he styles himself. It is not mentioned by a single early biographer or commentator, and there is no early manuscript of it. There is reason for believing Mancetti not to have been a very scrupulous person. Moreover, the work itself, which is devoted to the question whether the water, i. e. the sea, is anywhere, owing to its sphericity, higher than the land, is full of the most extraordinary anticipations of the science of the fifteenth century. Mancetti admitted that he had not given the text as he found it, because it was *plurimis locis adulterinum*, but *castigata, limata, elucubrata*. Who knows how far his corrections may have gone, even if he had an authentic manuscript to start with?

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A. R. Marsh.

Danton, dăn′tōn′, George Jacques: a leader of the first French Revolution; b. at Arcis-sur-Aube, Oct. 28, 1759; of a respectable family in very moderate circumstances; received a good education, and entered on the practice of law in Paris. At the beginning of the revolution he was practicing law with success, happy in his domestic relations and fond of good reading. He was one of the founders and leaders of the club of Cordeliers, which was from the first the center of the extreme popular party in the French Revolution. In the autumn of 1790 he was chosen commander of the battalion of the national guard of his district, and in the beginning of 1791 elected administrator of the department of Paris. As a great revolutionary leader he first won prominence in 1792. In the early months of that year the breach between the Legislative Assembly and the king and queen daily increased. In April war was declared against Austria, and the agitation of the foreign war was thus added to the tumult and confusion of civil affairs. Paris finally broke out in the bloody insurrection of Aug. 10, 1792, which began the Reign of Terror. Danton is generally credited with having instigated this rising. Certain it is that on the day following it he was raised to the post of Minister of Justice. Here he was associated with Roland and others of the Girondists. The success of the enemy on the frontier threw Paris in a panic which presently became murderous. On Sept. 2 Danton delivered a powerful speech in the assembly, closing with the words, "What must we do to conquer and crush them? Dare, dare again, and forever dare!" (*Il nous faut de l'audace, encore de l'audace, et toujours de l'audace.*) The same evening the September massacre took place, when several hundred prisoners were butchered in the prisons. It is not clear that Danton did more than make the best of this terrible action.

He became a member of the Convention; took a foremost part in its deliberations; joined the Mountain, as the most extreme revolutionists were called, on account of the high and remote benches they occupied; voted for the death of the king Jan., 1793; was prominent in the establishment of the Revolutionary tribunal: was a member of the Committee of Public Safety; aided in the overthrow of the Girondists, but did not become a member of the new Committee of Public Safety, although he himself had proposed giving it dictatorial powers. The Terror policy was now thoroughly intrenched. Danton could not approve of the unnecessary excesses, but he was not able to prevent them. Seeming to fall into a sort of apathy, he either thought himself helpless or underrated the strength of his enemies. At last Billaud de Varennes induced Robespierre to move against Danton. On Mar. 30 Danton, Desmoulins, and others of his followers were suddenly arrested and taken before the Revolutionary tribunal, which proceeded to sentence him at once. His vehement bearing led the authorities to fear that he might excite the crowd in his favor. When questioned as to his name and residence he said, "My name is Danton, my dwelling will soon be in annihilation, but my name will live in the pantheon of history." He felt that he left everything in terrible confusion, and predicted that Robespierre would soon follow him to the guillotine, which prediction was verified three months after. Danton, with fourteen others, including Desmoulins, was guillotined Apr. 5, 1794. He exhibited to the last his usual intrepid demeanor. In person Danton was tall, muscular, of ardent temperament, and stentorian voice. "Nature," said he, "has given me the athletic form and harsh expression of liberty." He was a powerful speaker, and, after Mirabeau, probably the greatest orator in a period when great orators were so numerous. He was an able politician, though a vehement one, and personally courageous (in this a striking contrast to Robespierre). He probably understood more clearly than any other man the force and direction of the political currents of those turbulent times. Violent as his measures were, his policy was yet marked by steadfastness and practical judgment. "Nothing," says Lamartine, "was wanting to make Danton a great man except virtue."

C. H. Thurber.

Dant'zic (in Germ. *Danzig*): a fortified city and seaport of West Prussia; on the left bank of the Vistula; 3½ miles from its entrance into the Baltic Sea; lat. 54° 21′ N., lon. 18° 40′ E. (see map of German Empire, ref. 2–I) It is traversed by the rivers Motlau and Radaune, which here enter the Vistula, and is the terminus of a railway from Berlin, 250 miles to the W. S. W. The mouth of the Vistula is obstructed by sand-bars, which prevent the access of vessels drawing more than 9 feet of water. Dantzic is surrounded by walls, and defended by a citadel and outworks. It contains a fine cathedral, begun in 1343 and finished in 1503; numerous Lutheran and Roman Catholic churches, an exchange, a town-hall, two gymnasiums, two grammar schools, hospitals, schools of navigation, midwifery, and commerce, a school of arts and trade, an observatory, a public library, a museum, an arsenal, and a dock-yard. Excellent timber is exported from this place, and great quantities of wheat out of Poland. The granaries on the Speicher island, on which fire is prohibited, are capable of storing 2,000,000 to 3,000,000 bush. Much of this grain comes down the Vistula and Bug on rude floats. The manufactures include beer, spirits, tobacco, sugar, flour, ironware, machinery, and gold and silver ornaments. In 1889 1,379 vessels, of a total tonnage of 420,919 tons, entered the port, and 1,735 vessels, 507,398 tons, left it. The exports amount to $15,000,000 annually. Dantzic was founded in the tenth century or earlier. It was occupied by the Teutonic Knights from 1310 till 1454, when it became a free state under the protection of Poland. It also was for a long time one of the cities of the Hanseatic League. On the partition of Poland in 1793 it was annexed to Prussia. Dantzic has been twice besieged. The first and most famous siege was by the French in the winter and spring of 1807, in which the utmost skill of the French engineer and the science of the French artillerist were successfully illustrated. Marshal Lefebvre, the French commander, was created Duke of Dantzic. The second siege was more properly a blockade made by the allies (Prussians and Russians) in the winter and spring of 1813 after Napoleon's disastrous Russian campaign. Gen. Rapp, commanding the Tenth Corps, held the place, and brilliantly maintained himself until the cessation of hostilities (June 10) under the armistice concluded between Napoleon, Alexander, and the Prussian king. Pop. (1880) 108,549; (1900) 140,539.

Revised by C. H. Thurber.

Dan'ube (anc. *Ister* and *Danubius*; in Germ. *Donau*; Hun. *Duna*): the largest river of Europe next to the Volga. According to the usual view the Danube is supposed to be formed by the union at Donaueschingen of two streams, the Brigach and the Brege, which rise in the Black Forest of Baden, at a height of 2,250 feet above sea-level. It flows through Würtemberg and through Bavaria with a N. E. course. It then turns to the S. E. and crosses the boundary of Germany and Austria at Passau, where it is 230 yards wide. In Bavaria it receives five Alpine rivers, the Lech, Isar, Inn, Altmühl, and Regen. From Lintz to Presburg in Hungary it takes a generally E. course, receiving the Ens and the Morava. It then flows S. E. to its junction with the Raab, and E. to Waitzen, whence it flows S. through the great plain of Hungary, receiving on its course the Waag, the Gran, and the Drave. After meeting the latter it flows S. E., taking in the Theiss and the Temes, and at Belgrade, the Save, where it begins to form the boundary between Hungary and Servia. At Semlin, opposite Belgrade, it is 1,700 yards wide, but farther on it becomes much narrower and very turbulent, being only 129 yards wide at the passage of the Iron Gate below Orsova, where it leaves the dominions of Hungary.

A canal, cut through and around the obstructions at the Iron Gate, completed on Sept. 27, 1896, opened the upper Danube to vessels of considerable size. From Orsova the river flows S. E., N. E., and N. to Galatz, making a loop of

a curve, after which it receives the Pruth and flows E. to the Black Sea. The delta covers an area of 1,000 sq. miles and consists of innumerable lakes and channels. Shipping enters by the Sulina or middle mouth, from which 1,716 vessels of 1,619,703 tons cleared in 1894. Improvements at this mouth (1894–95) raised the depth over the bar to 23½ feet, and cuttings have been made and others nearly completed (1899) with the object of avoiding difficult bends. The total length of the river is about 1,770 miles, and it drains an area of over 300,000 sq. miles.

Danube, Regulation of the: placing the river under the protection of international law in accordance with the terms of the Peace of Paris (1856). Its navigation was made free to the ships of all nations, and a joint commission, composed of representatives from the seven signatory powers and known as the European Commission of the Danube, was appointed to prevent the violation of its neutrality and to promote works of improvement along its lower course. Successive treaties have continued this commission, guaranteeing the permanent neutrality of all improvements that it shall make, and granting it various sovereign powers over the river below Isakcha, such as the collection of taxes to pay for the expenses of the works undertaken. The riparian powers are represented in another commission, also permanent, whose primary object has been to remove obstructions in the Iron Gate, for which purpose they have the right to collect a tax from vessels navigating the river. The Austrian Government changed the course of the Danube opposite Vienna by confining its current to a straight, deep channel along a well-constructed quay. A large area of land was reclaimed for agricultural purposes, and a fine water-front secured. The work was begun in 1869, under a commission, completed in 1881, and cost not less than 32,000,000 gulden, equal to about $16,000,000.

Revised by F. M. Colby.

Danvers: railway junction; Essex co., Mass. (for location of county, see map of Massachusetts, ref. 1–I); 20 miles N. by E. from Boston. It has extensive manufactures of shoes, leather, and brick, lumber and coal wharves at Danvers Port, an iron-foundry, a State insane asylum, public library, and water-works. Danvers formed a part of Salem until 1756. Pop. of township (1880) 6,598; (1890) 7,454; (1900) 8,542.

Editor of "Mirror."

Danville: city and railway center; capital of Vermilion co., Ill. (for location of county, see map of Illinois, ref. 6–G); is situated on the Vermilion river. It has car-shops, numerous factories, several coal mines, three public parks, a free library, a high school, and graded schools. Pop. (1880) 7,733; (1890) 11,491; (1900) 16,354.

Editor of "News."

Danville: town (founded in 1824); capital of Hendricks co., Ind. (for location of county, see map of Indiana, ref. 6–D); on Clev., Cin., Chi. and St. L. R. R.; 19 miles W. of Indianapolis: has 5 churches, 5 graded schools, high school, the Central Normal School, planing-mill, sash-factory, and flouring-mill. Pop. (1880) 1,598; (1890) 1,569; (1900) 1,802.

Editor of "Republican."

Danville: town; capital of Boyle co., Ky. (for location of county, see map of Kentucky, ref. 3–H); on railway, 96 miles S. E. of Louisville. It is the seat of Centre College, the Danville Theological Seminary (North Presbyterian), Caldwell Female College (Presbyterian), Hogsett Academy, Morrison Female Seminary, and a State deaf and dumb institute. It has six churches, good public schools, and manufactures of carriages and dressed lumber. The surrounding region is a rich agricultural and stock-raising district. Pop. (1880) 3,074; (1890) 3,766; (1900) 4,285.

Editor of "Kentucky Advocate."

Danville: borough and railway center; capital of Montour co., Pa. (for location of county, see map of Pennsylvania, ref. 4–G); on the North Branch of the Susquehanna; 50 miles S. W. of Wilkesbarre, and 67 miles N. by E. from Harrisburg. It contains 7 blast furnaces, 6 rolling-mills, and numerous other manufactories. Good iron ore, limestone, and anthracite coal are found in the vicinity. Pop. (1880) 8,346; (1890) 7,998; (1900) 8,042.

Danville: town and railway center; Pittsylvania co., Va. (for location of county, see map of Virginia, ref. 7–F); on the falls of Dan river, 141 miles W. S. W. of Richmond. Its chief industry is the trade in and manufacture of tobacco. The sales of leaf tobacco in 1891 amounted to $40,000,000 lb. The town has 22 tobacco-factories, 104 leaf-handling establishments, 3 cotton-factories, and various other industries. It is the seat of two colleges for women and a military institute. The town of Danville includes Danville city and North Danville. Pop. of town (1880) 8,726; (1890) 14,104; (1900) 16,520.

Editor of "Register."

Daphnæ: See Egypt, Ancient, and Tahpanhes.

Daph'ne (in Gr. Δάφνη): in Greek mythology, a nymph beloved by Apollo. To escape from him she besought the aid of the earth, which opened to receive her, and she was transformed into a laurel-tree.

Daphne: a celebrated grove and sanctuary of Apollo, 5 miles S. W. of Antioch in Syria; frequented by heathen pilgrims and voluptuaries. Here was a temple of Apollo, surrounded by beautiful groves of laurel and cypress trees, gardens, and baths. This place was appropriated to the indulgence of licentious pleasures, and was the scene of an almost perpetual festival of vice.

Daphne [Gr. δάφνη, the laurel-tree]: a genus of dicotyledonous shrubs of the family *Thymelæaceæ*, including about eighty species, all natives of the temperate and sub-tropical portions of the eastern hemisphere. They have entire, often evergreen, leaves, apetalous, clustered flowers, a cylindrical four-lobed corolla-like calyx, bearing eight stamens, and including a sessile, one-celled, one-ovuled ovary, which becomes a one-seeded berry, reputed to be poisonous. Many species are grown in conservatories, and the more hardy sorts are planted in gardens for their beautiful flowers and foliage. *D. mezereum*, with deciduous leaves, and *D. cneorum*, with evergreen leaves, both from Europe, are hardy in most portions of the U. S. C. E. B.

Daphnia [from Gr. Δάφνη, a nymph]: a genus of fresh-water Entomostracans belonging to the order *Cladocera*, and characterized by having a bivalve shell, five pairs of feet, and long swimming antennæ. They form an important element in the diet of many fresh-water fishes. J. S. K.

Daph'nis (in Gr. Δάφνις): in Greek mythology, a beautiful youth of Sicily; the son of Mercury and a nymph of the country. He was reared amid groves of laurel (δάφνη), whence his name, and was taught by Pan to play on the pipe. He became a herdsman, and tended his herds on Mount Ætna, where he won the love of a naiad, who for his supposed unfaithfulness punished him with blindness. He prayed his father for relief, and Mercury transferred him to heaven. The invention of bucolic poetry was ascribed to him. The story of Daphnis forms the subject of the first idyl of Theocritus, and the name frequently occurs as a character in descriptions of pastoral life.

Da Ponte daa-pōn'tā, Lorenzo: poet; b. in Venice, Italy, Mar. 10, 1749. He became Latin secretary to the Emperor Joseph II. in Vienna, where he composed several operas. After he had resided for some years in London, he emigrated to New York in 1805. About 1828 he was appointed Professor of Italian in Columbia College. He wrote the libretto for Mozart's *Don Giovanni* and other works. D. in New York, Aug. 17, 1838.

Darbhan'ga: town of India; capital of district of the same name; on the Baghmati; 78 miles by rail N. E. of Patna. It has considerable trade in salt, timber, grain, oil seeds, indigo, etc. Pop. (1891) 73,561. The district is a very fertile alluvial plain. Manufactures of cloth, saltpeter, pottery, etc., are also carried on. Area, 3,335 sq. miles.

D'Arblay, Madame (originally *Frances Burney*): English novelist; b. at Lynn-Regis, June 13, 1752; a daughter of Charles Burney, the musician. Her father removed to London in 1760, and his house was frequented by Burke, Dr. Johnson, Garrick, and other *literati*, but in these assemblies "Fanny" was a silent and diffident spectator. Her first novel, *Evelina*, published anonymously in 1778, had a great success. In 1782 she produced *Cecilia*. She was second keeper of the robes to Queen Charlotte (1786–91), and wrote an interesting account of court experience in her *Diary and Letters* (7 vols., 1842–46). In 1793 she was married to Count d'Arblay, a French exile. In 1795 she published a tragedy, *Edwy and Elvina*, which was a failure, as was her last novel, *The Wanderer* (1814). Her third novel, *Camilla* (1796), was only a pecuniary success. She lived in France much of the time between 1802 and 1818. D. at Bath, Jan. 6, 1840.

Darboy, dăar'bwăă'. Georges: ecclesiastic; b. at Fayl-Billot, France, Jan. 16, 1813; became in 1839 teacher of philosophy and theology at the seminary of Langres; in 1859 Bishop of Nancy; and in 1863 Archbishop of Paris. At

the Vatican Council he was a decided opponent of papal infallibility, but he recognized it when it was promulgated. On Apr. 5, 1871, he was arrested by the Communists, and when the government troops took the city he was with five others shot at the prison of La Roquette May 24. Among his prominent works are *Les saintes femmes* (1850); *Les femmes de la Bible* (1849, 2 vols.; 5th ed. 1859); *La vie de St. Thomas à Becket* (2 vols., 2d ed. 1860). See his *Life* by J. A. Foulon, Paris, 1889.

Darby: borough; Delaware co., Pa. (for location of county, see map of Pennsylvania, ref. 6–J); situated on railway; 6 miles S. W. of Philadelphia. It has worsted-mills, and contains the residences of many Philadelphia business men. Pop. (1880) 1,779; (1890) 2,972; (1900) 3,429.

Darby, William: geographer and statistician; b. in Pennsylvania in 1775. He was an officer under Jackson, serving in Louisiana, and assisted in the survey of the boundary between the U. S. and Canada. He was the author of numerous works, among which are a *Geographical Description of Louisiana* (1816); *Geography and History of Florida* (1821); a *Geographical Dictionary*; and a number of gazetteers and other works. D. in Washington, D. C., Oct. 9, 1854.

Darbyites: See Plymouth Brethren.

D'Arc, Jeanne: See Joan of Arc.

Darcet, dăr'sā', Jean Pierre Joseph: chemist; b. in Paris, France, Aug. 31, 1777; the son of Jean Darcet (1727–1801), director of the porcelain manufactory at Sèvres, who discovered the combustibility of the diamond. He added several useful discoveries to practical chemistry, important improvements in the manufacture of powder and in the composition of bronze and steel, the production of soda from common salt, etc. D. in Paris, Aug. 2, 1844.

Dardanelle: town; one of the capitals of Yell co., Ark. (for location of county, see map of Arkansas, ref. 3–B); beautifully situated on the south bank of the Arkansas river, about 80 miles above Little Rock. It has machine-shops, cotton-gin, distillery, and planing-mill. Its cotton trade amounts to 15,000 bales annually. Pop. (1880) 748; (1890) 1,456; (1900) 1,602. Editor of "Post."

Dar'danelles (anc. *Hellespontus*), called also the **Strait of Gallip'oli**: a narrow channel connecting the Sea of Mármora with the Ægean Sea and separating the peninsula of Gallipoli from Asia Minor. Its length is about 45 miles and average width between 3 and 4 miles. As it is of great strategic importance, and is considered the key to Constantinople, it is defended by forts at Tchanak-Kalessi on the Asiatic side and at Kilid-Bahr on the European side, and by other forts at the entrance to the Ægean Sea. The first two are mounted with heavy Krupp guns. It was crossed by Xerxes in 480 B. C. by means of floating bridges, and again by Alexander the Great in 334 B. C. The Dardanelles are closed to foreign ships of war by a stipulation of 1878, but an agreement between Turkey and Russia in 1891 has permitted free passage to the volunteer fleet of Russia.

Da'res: a Trojan, companion of Æneas; distinguished for his skill in boxing. At the games in honor of Anchises in Sicily, Dares challenged all competitors, but was defeated and nearly slain by the aged Entellus.

Dares: a priest of Vulcan in Troy, to whom was ascribed an Iliad, written on palm-leaves, before that of Homer. Ælian states that he knew the work as existing in his own day (150 A. D.), but that work, whatever its character, must have been the production of some post-Homeric writer. There is still extant, under the name of Dares Phrygius, a narrative in prose of the destruction of Troy (*De Excidio Troiæ Historia*) in forty-four chapters. A letter prefixed, addressed to the historian Sallust, states that this narrative was translated from the Greek by Cornelius Nepos, who met with the original in Athens. The Latinity shows the production to be of a later age than that of Nepos, and probably as late as the fifth century. It was edited, along with *Dictys Cretensis*, by Madame Dacier, as one of the volumes of the Delphin classics (Paris, 1680); most recently by F. Meister (Leipzig, 1873). See also Dictys.

Revised by M. Warren.

Dar-es-Salaam: the capital of German East Africa, on the coast nearly opposite the southern point of Zanzibar. See German East Africa.

Dar Fertit, daar'fer-teet': the name given by the Arabs to a large area of Negro countries S. of Darfur, between 24° and 27° E. lon. and 6° and 10° N. lat. This region has been the prey of slave-hunters since 1820. One of the oldest domains in Central Africa of the Arab slave-trade, and naturally rich in ivory, rubber, and other resources, it is yet almost an uninhabited wilderness. All places on maps of this region having the prefix "Dem" indicate the zeribas or fortified stations of slave-traders. See Schweinfurth's *Heart of Africa*; Junker's *Travels in Africa* (Keane's translation, London, 1892); and Gessi's *Seven Years in the Sudan* (London, 1892). C. C. Adams.

Darfur, dăar-foor': a country of Central Africa; in the E. part of Sudan; mostly included between lat. 10° and 16° N. and lon. 26° and 29° E. The country is crossed by a range of mountains called Marra. It is fertile in the rainy season, with the exception of the northern part, which is sandy and arid. Grain, tobacco, dates, and watermelons are produced in abundance, and the inhabitants possess large numbers of cattle, camels, horses, and sheep. The people are Mohammedans, a mixture of Arabs and Negroes. Darfur carries on a trade with Egypt by means of caravans, and exports slaves, ivory, copper, hides, and ostrich-feathers. It is ruled by a sultan who has despotic power and resides at Tindelly. The chief commercial town is Kobbe. Darfur was reduced by Ziber Pasha in 1874, bringing it under the control of the Khedive of Egypt, but revolted in 1882. Since the Mahdi's revolt it has resumed its independence. Area, about 200,000 sq. miles. Pop. (estimated) 1,500,000. Darfur is included within the sphere of influence of Great Britain by agreements with Germany (1890) and Italy (1891).

Dar'ic [from Gr. δαρεικός = O. Pers. *darīka*, gold-piece; cf. Avestan *zairi*, golden: Skr. *hari*. The word has no connection with the name *Darius*]: an ancient Persian gold coin, having on the obverse an archer crowned and kneeling, and on the reverse a quadrata incusa or royal palla. In value it was equal to about seven U. S. gold dollars. Several of these coins are preserved in European collections. The daric is essentially the same coin as the Greek *chrysus* (χρυσοῦς) and *stater* (στατήρ) of gold, and also the Roman *aureus* (which, like χρυσοῦς, signifies golden), though the last-named coin appears to have varied more in weight than the Greek stater, averaging about 121 grains. The daric weighed two Attic drachmæ = 133 grains Troy, or in later times considerably less. It was used in Greece as well as in Asia.

Darien (probably from the old name of the Atrato river): the first colony of Europeans on the mainland of America after its discovery in 1499. In 1508 Diego de Nicuesa and Alonzo de Ojeda received grants from King Ferdinand of Spain to settle and govern what was then known as Tierra Firme, or the land on the southwestern side of the Caribbean Sea. Two governments were erected for them. The first, called Nueva Andalucia, was assigned to Ojeda, and corresponded with the present coast of Colombia, from the Gulf of Darien eastward to Cape de la Vela; the second, officially called Castilla del Oro, extended from the Gulf of Darien westward to Cape Gracias á Dios. As usual, only the coast limits were given, the inland extent being undetermined; and it should be remembered that the existence of an isthmus in this region was as yet unknown. At San Domingo, whither they had gone to engage men and vessels, Ojeda and Nicuesa quarreled about the respective limits of their domains; but by the intercession of Juan de la Cosa, Ojeda's pilot, it was agreed that the river Atrato should be the boundary. Martin Fernandez de Enciso, a lawyer of San Domingo, agreed with Ojeda to embark his fortune in the enterprise, and was named *alcalde mayor*. Ojeda sailed from San Domingo Nov. 10, 1509, with two ships, two brigantines, and 400 men, Enciso being left to follow later with re-enforcements. Landing with part of his force at the bay of Cartagena, he was attacked by Indians, his men, including La Cosa, were killed, and Ojeda was wounded, and concealed himself in the swamps for several days, when he was found by a party from the ships. Just then Nicuesa and his fleet touched at Cartagena on the way to Castilla del Oro, and, forgetful of his old quarrel, he aided Ojeda, landed a force which put the Indians to flight, and finally sailed away to his own government. Ojeda then went on to the Gulf of Darien, where, on the eastern side, near the entrance, he built the fort of San Sebastian, intended to be the basis for his capital city. He soon had so much trouble with the natives that he could hardly leave the fort, and the Spaniards died in great numbers from

famine and disease. They obtained some scanty supplies from one Talavera, a piratical cruiser who touched there; and at length Ojeda, who had been severely wounded by the Indians, sailed off on Talavera's ship to seek aid at San Domingo; shipwrecked at Cuba, he returned no more. Francisco Pizarro had been left in charge of the fort, with instructions to wait fifty days for Ojeda, after which he and the garrison were left free to do what they pleased. When the fifty days had passed they found that their number, though now reduced to only seventy men, could not crowd into the small vessels which had been left to them; and they deliberately waited until disease and starvation had reduced them to the capacity of the boats. Then, sailing to Cartagena Bay, their number still further reduced by a shipwreck, they met Enciso, who had at length come with his tardy re-enforcements. Enciso deposed Pizarro and resolved to return to San Sebastian. He found the fort and houses destroyed, and by advice of Balboa, who had come with him and knew these coasts, he crossed the Gulf of Darien, and about Aug., 1510, founded the colony of Santa Maria de la Antigua del Darien. This town prospered. Enciso, who was disliked, was deposed, and Balboa and Zamudio were chosen leaders. Meanwhile Nicuesa's expedition had come to grief, and he was left with a few men in a terrible condition near Nombre de Dios. Hearing of this, and remembering that they were now in the territory assigned to him, the colonists of Darien sent for him. But his overbearing conduct quickly provoked their enmity; he was forced to sail away in an old, leaky ship, and was never again heard of. Balboa remained the leading spirit at Darien until the arrival of Pedrarias in 1514; and from this point he made his celebrated journey across the isthmus, discovering the Pacific. In 1519 Panama was founded and became the capital, and the original town of Darien, being in an unhealthy locality, was abandoned. But at Panama the expeditions parted which eventually led to the conquest of Peru, Chili, Charcas, or Bolivia, and New Granada, and on the other side a large part of Central America. Thus Darien was the nucleus from which sprang all the great states of Spanish America, except the islands which were already colonized, Mexico, Venezuela, and the Rio de la Plata. See Helps, *Spanish Conquest in America*; Bancroft, *Central America*, vol. i.; Oviedo, *Historia general.* HERBERT H. SMITH.

Darien: port of entry and capital of McIntosh co., Ga. (for location of county, see map of Georgia, ref. 6–K); on the Altamaha river; 12 miles from the sea and 60 miles S. S. W. of Savannah. Pine lumber is exported from it. Pop. (1880) 1,543; (1890) 1,491; (1900) 1,739.
EDITOR OF "TIMBER GAZETTE."

Darien, or Urabá, Gulf of: an inlet of the Caribbean Sea in the coast of Colombia; at the extreme northwestern angle of South America, between the continent and the Isthmus of Panama. It is about 30 miles long, averaging 7 miles broad, and the central part is deep, but the shores are lined with shallows, and are in great part low, marshy, and unhealthy. There are two or three small villages on the shores, forming the only ports. The river Atrato enters the gulf by several mouths. HERBERT H. SMITH.

Darien, Isthmus of: as commonly used, the same as THE ISTHMUS OF PANAMA (*q. v.*); in a more restricted sense, that portion of the Isthmus of Panama which forms a narrow neck between the Gulfs of San Miguel and Darien. From the broken nature of the ground and the absence of a good port on the Caribbean side, this part is less favorable to transit than the portion between Panama and Aspinwall.
HERBERT H. SMITH.

Darien Scheme: one of the most disastrous projects in the history of American colonization. In 1695 the Scottish Parliament passed an act for a company trading in Africa and the Indies, which, under the advice of WILLIAM PATERSON (*q. v.*), founder of the Bank of England, determined to establish a colony on the Isthmus of Darien (now Panama) which should be an emporium for the world's commerce. The plan was taken up with national enthusiasm in Scotland, much as the Panama Canal scheme was welcomed in France. July 26, 1698, some 12,000 colonists sailed from Leith and reached Darien Nov. 4. Lack of provisions, sickness, and anarchy worked the ruin of the plan. Spite of successive re-enforcements the whole enterprise went to pieces, somewhat aided in dissolution by Spanish troops, and only a wretched handful of survivors ever returned to their native land. C. H. THURBER.

Darius (in Gr. Δαρεῖος; Old Egyptian, *Ntreioush*; Modern Persian, *Dara*, or *Darab*; Heb. *Daryavesh*; Old Persian (cuneiform), *Daryuhwsh*) **I.**, or **Darius Hystaspes**: King of Persia; son of Hystaspes, a member of the noble family of Achæmenidæ. He was called Gushtâsp in the legends of Persia. He was one of seven noble Persians who conspired against and killed the usurper Smerdis, whom he succeeded in 521 B. C. He married two daughters of Cyrus the Great, and organized the extensive empire which Cyrus and Cambyses had enlarged by conquest. Babylon revolted against him, but was after a long siege reduced to subjection in 516. Soon after this date he conducted a large army against the nomadic Scythians of Europe, whom he was not able to conquer or defeat. He sent a great army to conquer and chastise the Greeks, some of whom had offended him by aiding the Ionians in their revolt against Darius. His army was routed at the great battle of Marathon, 490 B. C. He was preparing to renew the invasion of Greece, when he died in 486 B. C., in the sixty-third year of his age, and was succeeded by his son Xerxes, who reigned from 486 or 485 to 465 B. C. There is little doubt that at first the name Darius was a title rather than a proper name.

Darius II., called **Darius Ochus**, or **Nothus**: King of Persia; a natural son of Artaxerxes Longimanus. He married Parysatis, his aunt, a daughter of Xerxes I. In 424 B. C. he deposed and succeeded the usurper Sogdianus, who had killed Xerxes II., the lawful heir. His reign was ignoble, and disturbed by the rebellions of several satraps. He had two sons of whom the younger, CYRUS (*q. v.*), is famous from the description of his life and character contained in Xenophon's *Anabasis*. His character was weak, and he was the slave of the eunuchs of his court. He died in 405 B. C., and was succeeded by his son Artaxerxes Mnemon.

Darius III., surnamed CODOMANNUS: the last king of the ancient Persian monarchy. A descendant of Darius II., he ascended the throne in 336 B. C., on the death of Arses. In the year 334 his empire was invaded by Alexander the Great of Macedon, who gained a victory at the river Granicus. Darius, commanding in person, was defeated at Issus in 333, and again at Gaugamela, near Arbela, in 331 B. C. He retreated toward Bactriana, pursued by the victorious army, which had nearly overtaken him when he was murdered by Bessus, one of his satraps, in the year 330. The wife and daughters of Darius were captured at the battle of Issus. Alexander married his daughter Statira.

Darjil'ing, or **Darjeel'ing**: a sanitary station of British India; in a district of the same name, belonging to the Rajashahi division of Bengal; at an elevation of over 7,300 feet above the level of the sea; on a narrow ridge rising from the river Runjeet; 308 miles N. of Calcutta. It has a sanatorium and a good water-supply, and is a favorite resort of the Anglo-Indians, especially in October after the cessation of the heavy summer rains. Pop. with cantonment (1891) 14,100.

Dark Ages: the period between the fall of the Roman empire and the revival of letters about the thirteenth century. As this revival occurred earlier in Italy than in Northern Europe, the Dark Ages may justly be said to have been of longer duration in the North than in the South. See MIDDLE AGES.

Dark Day: refers especially to May 19, 1780, which was very dark in Connecticut, New York, and New Jersey, causing great alarm. Similar days have occurred from time to time in other places when, as in the case above, the failure of light is not due to solar eclipses. The darkness is sometimes due to fog—as in London—sometimes to an unusual thickening of the clouds, or an abundance of smoke.
M. W. H.

Darke, WILLIAM: soldier; b. near Philadelphia, Pa., in 1736; removed with his parents to Virginia in 1740; served under Braddock at his defeat in 1755; and served throughout the Revolutionary war, in the latter part of which he held a colonel's commission. He became an influential citizen and a major-general of Virginia militia; served in Ohio and at St. Clair's defeat (Nov. 4, 1791), acting as lieutenant-colonel of the levies, and fighting with desperate valor against the Miamis. He was dangerously wounded, and his youngest son was killed. D. in Jefferson co., Va., Nov. 26, 1801.

Darkhan, dăar-*k*haan', **Mt.**: a high granite mountain range in Mongolia; in lat. 47° 36′ N., lon. 110° 10′ E.; is 140 miles S. E. of Urga. Here is a monument erected to the memory of Genghis Khan, to honor whom the Mongolians assemble here annually.

Darley, Felix Octavius Carr: artist; b. in Philadelphia, Pa., June 23, 1822; son of John Darley, an actor of English birth. Felix Darley devoted himself to art when a youth, and was employed by publishing-houses in Philadelphia; removed to New York in 1848; published outline illustrations of Judd's *Margaret* (1856); Irving's *Legend of Sleepy Hollow*; Hawthorne's *Scarlet Letter* (1879), and other works; illustrated the novels of Cooper, Simms, and Dickens, Lossing's *History of the United States*, and many other publications; member of Academy of Design 1852; an early member of the Society of Painters in Water-colors. Painted a number of pictures depicting scenes in American history; wrote and published *Sketches Abroad with Pen and Pencil* (New York, 1868). D. in Claymont, Del., Mar. 27, 1888.

Darling: a river of Australia; in New South Wales; formed by numerous branches which rise on the western declivity of the Australian Alps. They converge into a central basin of clay, where their channels unite and separate again into branches in a singular manner. Below the union of these branches the Darling flows southwestward through arid plains, and enters the Murray near lat. 34° S. The main stream is about 600 miles long.

Darling, Grace: b. at Bamborough, England, Nov. 24, 1815; a daughter of the keeper of the Longstone lighthouse, on one of the Farne islands. She rescued nine persons from the wreck of the steamer Forfarshire, Sept. 7, 1838. A public subscription of about £700 was raised for her. D. Oct. 20, 1842. See E. Hope, *Grace Darling* (1876).

Darling, Timothy Grenville, D. D.: Presbyterian minister and theologian; b. in Nassau, N. P., Bahamas, Oct. 5, 1842. He received his education at Williston Seminary, Mass., Williams College, and Princeton (1866–68) and Union Theological Seminaries, graduating at Williams in 1864, and at Union in 1869. He was assistant pastor of First Presbyterian church, Baltimore, 1870–73, and pastor of First Presbyterian church, Schenectady, 1873–87. He was acting Professor of Mental Science and Hebrew in Union College 1877; acting Professor of Moral Science 1885; lecturer on Christian Evidences 1886. He became Professor of Sacred Rhetoric and Pastoral Theology in Auburn Theological Seminary in 1887, and was transferred to the chair of Christian Theology in 1890. He has published articles and addresses.

Willis J. Beecher.

Darlington, or **Darnton**: parliamentary and municipal borough in the county of Durham, England; on the Skerne, near its junction with the Tees; 18 miles S. of Durham (see map of England, ref. 5–H). It has a fine church built in the twelfth century, with a tower 180 feet high. The town is well built, and is connected by railway with Stockton and other places. It has manufactures of locomotives, iron and steel, tanned leather, beer, and woolen goods, a grammar school, a high school for girls, a college for female teachers, and a free library. Pop. (1891) 38,060.

Darlington: city (founded in 1855); capital of Lafayette co., Wis. (for location of county, see map of Wisconsin, ref. 7–C); on Mineral Point division of Ch., Mil. and St. P. R. R., and on Pecatonica river; 50 miles S. W. of Madison; has churches of five denominations, high schools, and graded school, large flour-mill, feed-mill, and water-works. It is surrounded by a rich farming country, and is a shipping-point for live stock, grain, butter, cheese, and poultry. Pearls were discovered in the river in 1889, and have been a large source of revenue; there is here a mineral spring noted for its medicinal qualities. Pop. (1880) 1,372; (1890) 1,589; (1900) 1,808.

Editor of "Journal."

Darlington, William, M. D., LL. D.: botanist; b. in Birmingham, Pa., Apr. 28, 1782; practiced medicine at West Chester. He published a valuable work on the plants of Chester County, entitled *Flora Cestrica* (1837); *Agricultural Botany* (1847); *Memorials of John Bartram and Humphry Marshall* (1849), and several other works. He organized societies for the study of natural history and botany in West Chester. The *Darlingtonia californica*, a pitcher-plant of the Pacific States, was named in his honor. D. in West Chester, Pa., Apr. 23, 1863.

Darlington Court-house: town and railway junction; capital of Darlington co., S. C. (for location of county, see map of South Carolina, ref. 5–F); 75 miles E. N. E. of Columbia and 30 miles S. of Cheraw. The town has 7 churches (4 white), 2 schools, and excellent public buildings; it is an important cotton-trading center, shipping annually 20,000 bales; and has a cotton-factory with a capital of $225,000. Pop. (1880) 940; (1890) 2,389; (1900) 3,028.

Editor of "News."

Darlingto'nia [named in honor of Dr. William Darlington]: a genus of herbs of the family *Sarraceniaceæ*, comprising but one known species, the *Darlingtonia californica*, a perennial plant of California. Its leaves are all radical, and resemble somewhat closely those of the Sarracenias (pitcher-plants) of the Atlantic States, but the size of the leaves of the *Darlingtonia* is much the larger, the length in some instances exceeding 2 feet. The leaves are hollow and twisted, the upper part being turned over into a hood-like dome or vault, beneath which is the orifice which opens into the cavity or pitcher of the leaf. On either side of the opening two lobes depend, which may be taken to represent the true leaf, in which case the ascidium or pitcher must be considered as representing the petiole or leaf-stalk. Inside the pitcher the remains of insects are often found, their exit being impeded by long slender hairs within the leaf. The flower-stalk is sometimes 4 feet high, single, and furnished with bracts; the flower regular, nodding, and single, and about 2 inches across; the calyx straw-colored, of five sepals, all pointed; the five petals are pale purple, the stamens twelve to fifteen, nearly hidden by the top-shaped ovary, upon which there is a style with a five-parted stigma. The capsule is five-celled, many-seeded, and an inch long. This plant is the representative of the Sarracenias of the Atlantic States, and with them and the *Heliamphora* of South America constitutes the whole family as far as it is known at present.

Darmesteter, Arsène: French scholar; b. of Jewish parents, Jan. 5, 1846. He was destined by his father to be a rabbi, and received the education customary in such cases. His father, however—a very intelligent man—wished his son to have more than the customary training; to be a doctor of letters, as well as a rabbi. The son, meantime, inclined more and more to the studies this plan implied. Already scientific impulses had been awakened in him. In the Jewish school he had been struck with certain Old French glosses upon Hebrew words, occurring in the commentaries of Raschi, an eleventh-century Talmudist. These *laaz*, as they are called, written in Hebrew characters, had never been deciphered or explained in scientific fashion. Before he had done with them, Arsène Darmesteter had proved them to be our most precious evidence as to the exact form of the French tongue in the eleventh century. In 1867 he became a pupil of Gaston Paris in Old French, and from that time his name is indissolubly connected with the history of Romance philology. With rare sagacity, with creative imagination, with deep enthusiasm, he gave himself up to the study of the real life and history of the French tongue and of French literature. No one in our time has done more to throw light upon both. We can not here follow his researches; we can only give the list of his contributions to science. Suffice it to say that everything he produced abounds in original and profound suggestions, such as only a creative mind is capable of. In 1871 he was associated with M. Hatzfeld in making a new dictionary of the French language, and he labored upon the task for the rest of his life. A series of articles in the *Romania* showed his constant interest in the problems which had early engaged his attention. In 1877 he obtained the Doctor's degree on a highly original thesis touching the history of French epic (Floovent). The same year he published *De la création actuelle de mots nouveaux dans la langue française*, etc. In 1878 he published with M. Hatzfeld a *View of French Literature in the Sixteenth Century*, so excellent as to be now authoritative. In 1886 appeared his little treatise *La vie des mots étudiés dans leur signification*. In 1887 the dictionary was far enough advanced to permit the preparation of its preface. All this time he had been busily engaged in teaching, first in the École des Hautes Études, then in the Sorbonne, and finally in the École normale supérieure des filles at Sèvres. In 1888 he was attacked by an inherited disease, and d. Nov. 7, 1888. See *Reliques scientifiques d'Arsène Darmesteter, recueillies par son frère*, with a charming *Life* of him (Paris, 1890). A. R. Marsh.

Darmesteter, James: Orientalist; b. in Meurthe, France, Mar. 28, 1849; educated in Paris at the Lycée Bonaparte; began Oriental studies, 1872; became secretary of the Société Asiatique de Paris, 1881; and Professor of Iranian Languages and Literature at the College of France, 1885. In 1886 he went to India on a philological mission, and was

made a fellow of Bombay University, 1887. He was the author of *Haurvatât et Ameretât, Essai sur la Mythologie de l'Avesta* (1875); *Ormazd et Ahriman, leurs Origines et leur Histoire* (1877); *The Zend Avesta* (translated 1883); *Études iraniennes* (1883); *Essais orientaux* (1883); *Chants Populaires des Afghans* (1888–90); *Les Prophètes d'Israël* (1892); and various reports to the Société Asiatique de Paris from 1881. D. at Maisons-Lafitte, near Paris, Oct. 19, 1894.

Madame Darmesteter, his wife (*A. Mary F. Robinson*), was born Feb. 27, 1857, at Leamington, England; educated at University College, devoting herself especially to the study of Greek. She is the author of *A Handful of Honeysuckles* (1878); *The Crowned Hippolytus, a Translation of Euripides* (1880); *The New Arcadia and other Poems* (1884); *An Italian Garden* (1886). C. H. T.

Darm'stadt: a town of Germany; capital of the grand duchy of Hesse-Darmstadt; on the river Darm, and on the Frankfort and Mannheim Railway; 15 miles S. of Frankfort-on-the-Main (see map of German Empire, ref. 6–D). It is at the northwestern extremity of the Odenwald. It consists of an old and a new town, both surrounded by walls. The former is ill-built, but the new town has wide and handsome streets. It has five public squares and two ducal palaces, one of which contains a library of 500,000 volumes and a valuable collection of 700 paintings; the other contains Holbein's *Meyer Madonna*. There are manufactures of machinery, chemicals, tobacco, hats, playing-cards, carpets, and beer. Pop. (1885) 43,149; (1895) 63,745.

Darnel: a grass of the genus *Lolium*, well known in Europe, and naturalized in the U. S. The common darnel, *L. perenne*, a pretty good pasture-grass, is found in the Eastern U. S. The seeds of bearded darnel, *L. temulentum*, are reputed poisonous, but recent researches are said to have established their harmlessness. It is often infested by ergot.

Darnell, Henry Faulkner: See the Appendix.

Darnetal, dăr'ne-taal': a town of France; department of Seine-Inférieure; on the Aubette, 2½ miles E. of Rouen (see map of France, ref. 2–E). It has two Gothic churches, and manufactures of flannels and other woolen goods. Pop. (1896) 6,743.

Darnley, Henry Stuart, Lord: b. in England in 1541; a son of the Scottish Earl of Lennox. His mother was a niece of Henry VIII. of England. He had a handsome person, but was profligate and deficient in intellect. In 1565 he married Mary Queen of Scots, whom he soon offended by his insolence and other faults. He also procured the assassination of Rizzio, which aroused her deepest indignation. The isolated house in which he lodged was blown up with gunpowder at the instance, it was suspected, of his wife, and he was killed Feb. 10, 1567. See Mary Stuart.

Darnton: See Darlington.

Dart: a missile weapon, usually 4 to 6 feet long, differing in no essential feature from a javelin; consisting of a pointed head, usually of metal, and a wooden handle, sometimes winged with feathers or their equivalent. It was much used by the ancients, principally by the foot troops, was thrown by hand, and was sometimes provided with a strap which was attached to the wrist of the thrower, and by which it was recovered after being thrown.

James Mercur.

Darter: an aquatic bird related to the cormorants; belonging to the order *Steganopodes* and genus *Plotus*. The darters are lightly built, with a long, slender neck, straight-pointed bill, and long tail. They build a bulky nest in trees or bushes. Unlike the cormorants, the darters are more common in fresh than salt water. There are but three or four species, found in tropical or warm regions. They live upon fish, which they capture by diving, and there is a peculiar arrangement of the neck enabling the head to be extended suddenly, giving to the bill the effect of a spear-thrust. The darters, like the grebes, possess the power of sinking in the water, so that the head and neck are alone visible. The American species is found in North and South America, and occurs along the Gulf coast of the U. S., being common in parts of Florida, where it is commonly known as snake-bird, and occasionally as water-turkey. F. A. Lucas.

Darter: a small fish of the genus *Etheostoma*; abounding in the waters of Eastern North America. The darters belong to the perch family, and are reduced and intensified perches, brilliantly colored, and from 2 to 8 inches in length. They lie on the bottom of swift clear streams, among rocks, quiescent for considerable time, suddenly darting forward on their prey by a sudden movement of the large pectoral fins. About sixty species are known, some of them the most beautiful of all fresh-water fishes. David S. Jordan.

Dartford (Saxon, *Darentford*): a town of England; in Kent; on the river Darent, and on the London and Gravesend Railway; 14 miles by rail E. S. E. of London Bridge (see map of England, ref. 12–J). It lies in a narrow valley between two steep hills. It has cotton and silk printing-works, large powder-mills, manufactures of machinery, iron, paper, and leather, and an important pharmaceutical laboratory. Edward III. held a tournament at Dartford in 1331, and Wat Tyler's insurrection broke out here in 1381. Paper was first manufactured in England here in 1588. Pop. (1891) 11,962.

Dartmoor: a granitic plateau of Devonshire, England, occupying an area of 130,000 acres. It rises in the southern part of the county, and has a mean elevation of 1,200 feet. Hey Tor, one of the granitic crests in the south, is 1,500 feet high, and Yes Tor, in the north, reaches 2,050 feet. Dartmoor is principally moorland covered with heather, and the central part has been a royal forest since a period prior to the Norman conquest. It affords pasturage to numerous cattle, sheep, and ponies. Many rivers rise on Dartmoor. The Dart, the Teign, the Plym, and the Tarry flow S., and the Taw and the Torridge empty in Bideford Bay. Dartmoor is prolific in minerals, the most important being kaolin obtained from the felspar of the granite. At Lee Moor are the largest kaolin-works in England. Dartmoor is full of antiquities. There are numerous barrows, cromlechs, cyclopean bridges, etc., as well as the remains of a prehistoric village at Grimspound. The forest of Dartmoor was granted by Henry III. to his brother Richard, Earl of Cornwall, and since 1337 a part of Dartmoor has belonged to the duchy, though not to the county of Cornwall. Dartmoor is well known as the seat of a convict prison, that was originally built in 1806 for the reception of prisoners of war.

Dartmouth, daart'mŭth: a seaport-town of Devonshire, England; 32 miles S. by W. from Exeter; picturesquely situated on the terraced side of the right bank of the estuary of the Dart, near the ocean (see map of England, ref. 15–E). It has many old houses and an ancient castle. The entrance to the river is defended by a battery. Dartmouth is a quarantine port, and carries on a considerable trade with Newfoundland and the Mediterranean. It is the point of departure for the Castle line of mail-steamers to South Africa. Here Richard Lion-heart assembled the crusading fleet in the spring of 1190. Dartmouth was incorporated by charter of Edward III. in 1342; was attacked by the French in 1404; was taken by Prince Maurice in 1643; and recaptured in Jan., 1645–46, by Fairfax. Pop. (1891) 6,038.

Dartmouth College: the fourth of the New England colleges in chronological order—preceded only by Harvard, Yale, and Brown—and an offshoot of Moore's charity school, an institution for the education of Indian youth, established in Lebanon, Conn., in the year 1754, by the Rev. Eleazar Wheelock, D. D. The school was subsequently removed to Hanover, N. H., a charter for a college, to be connected with it, and yet a distinct institution, having been obtained. This charter was issued Dec. 13, 1769, by John Wentworth, the last of the royal governors of New Hampshire. Dr. Wheelock was its first president, and in view of the interest taken in the school by Lord Dartmouth, an English nobleman, and of his benefactions to it, his name was given to the college. One of the most signal events in the history of the institution is the controversy out of which arose the famous Dartmouth College case. The Legislature of New Hampshire passed an act in 1816, changing the name of the institution to "Dartmouth University," enlarging its board of trustees, and assuming the control of its affairs. To this act the trustees were opposed, and with the design of testing its constitutionality they brought an action before the Supreme Court of the State. By this tribunal the Legislature was sustained, and appeal was taken to the Supreme Court of the U. S., John Marshall being then chief justice. The cause of the college was there argued by Daniel Webster and other able counsel, and fully sustained by the court. The university organization was dissolved, and the old college board of trustees sustained. This great battle was fought by them not for themselves only; the principles concerned were vital to many other institutions. Dartmouth, in comparative poverty, was thus instrumental in vindicating and establishing the sacredness of private trusts.

The college has had nine presidents: Eleazar Wheelock, D. D., inaugurated in 1769; John Wheelock, LL. D., in 1779; Francis Brown, D. D., in 1815; Daniel Dana, D. D., in 1820; Bennet Tyler, D. D., in 1822; Nathan Lord, D. D., in 1828; Asa D. Smith, D. D., LL. D., in 1863; Samuel C. Bartlett, D. D., LL. D., in 1877; William Jewett Tucker, D. D., in 1893. Perhaps the two professions that have drawn most largely upon the institution have been those of teaching and the law. A single class might be named one-fourth of whose members have been either college presidents or professors; and it has been stated that at one time there were residing in Boston, Mass., no less than seven noted sons of the college, including Daniel Webster and Rufus Choate.

While the institution has aimed from the beginning at a high religious tone, it is not sectarian. Most of the trustees and teachers are of the orthodox Congregational connection. As to methods of teaching, while the college has always been conservative, it welcomes all real improvements. It holds to a carefully devised curriculum, but has many electives and options arranged in consecutive courses of study. It retains and honors the ancient classics, but it favors science and the modern languages also. More or less closely connected with Dartmouth College are several associated institutions founded at a later date, and in whole or in part under the same board of trustees—viz., the New Hampshire Medical College, established in 1798; the Chandler Scientific School, in 1851; the Thayer Engineering School, in 1871; the New Hampshire College of Agriculture and the Mechanic Arts, in 1866. The entire number of students in the college and associated institutions, in 1899-1900 was 741, and the entire number of instructors in the same was sixty-one. The library of Dartmouth College contains 85,000 volumes.

Daru, dȧ'rü', Pierre Antoine Noël Bruno, Count: statesman and author; b. at Montpellier, France, Jan. 12, 1767. In the Reign of Terror he was confined in prison, where he translated the odes and epistles of Horace in verse. He became a member of the Tribunate in 1802, a councilor of state in 1805, intendant-general of the imperial household, and commissioner for the execution of the treaties of Tilsit and Vienna. In the campaigns against Prussia and Austria (1806–09) he accompanied Napoleon, whom he served with ability as a diplomatist and financier. He became chief Minister of State in 1811, and opposed the Russian expedition; but when it was undertaken he put forth extraordinary efforts to meet its exigencies. He held office under the restored Bourbon monarchy; but having lost credit with the Government for espousing Napoleon's cause in the Hundred Days, he retired to private life till in 1819 he was called to the Chamber of Peers. In 1815 he was elected president of the French Academy. Among his works are a *History of Venice* (1819) and a translation of Horace. D. at his residence near Meulan, Sept. 5, 1829. See Lamartine, *Éloge du Comte Daru*.

D'Arusmont, dȧ'rüs'mōn', Madame Frances (maiden name, *Fanny Wright*): philanthropist and reformer; b. in Dundee, Scotland, Sept. 6, 1795. Her father was an intimate friend of Adam Smith, Dr. Cullen, and other distinguished men. In her youth she published a defense of the doctrines of Epicurus, entitled *A Few Days in Athens*; was in the U. S. 1818–21; visited France; returned in 1825, and purchased land where Memphis, Tenn., now stands for her famous experiment for the instruction and enlightenment of the colored race. After a number of years of expensive and unsuccessful effort, her people were freed and sent to Haiti. She lectured in many parts of the Union on social, religious, and political questions; she visited France, and in 1838 married M. d'Arusmont. The union was unfortunate, and with her daughter she returned to the U. S. D. in Cincinnati, O., Dec. 14, 1852. Author of *Views on Society and Manners in America*; *Altorf* (1819); *Lectures on Free Inquiry* (1836). See *Lives* by J. Windt (1844) and by A. Gilbert (1855).

Darwin, Charles Robert, F. R. S.: naturalist; a son of Dr. R. W. Darwin, F. R. S., and grandson of Dr. Erasmus Darwin; b. at Shrewsbury, in England, Feb. 12, 1809. He was educated in the grammar school of his native town, at the University of Edinburgh, and at Christ's College, Cambridge, where he took his degree of M. A. in 1831. The same year he sailed with Capt. Fitzroy, of H. M. ship Beagle, as volunteer naturalist in the survey of the coast of South America, etc. His observations, made during this voyage, on the peculiarities shown by the birds of the Galapagos islands may perhaps be deemed the starting-point of the train of thought which culminated in the *Origin of Species*. After his return in 1836 from this voyage, in which he sailed round the globe, Mr. Darwin published a *Journal of Researches into the Geology and Natural History*, etc. (1839; 2d ed. 1854; New York ed. 1846), which has been pronounced the "most entertaining book of genuine travels ever written." In 1839 he married his cousin, Emma Wedgwood, granddaughter of Josiah Wedgwood. Mr. Darwin published (1840–42) the *Zoölogy of the Voyage of the Beagle*; a treatise on *Coral Reefs* (1842); on *Volcanic Islands* (1844); and *Geological Observations* (1846). *A Monograph of the Cirripedia* (1851–53) would have given him a lasting reputation as a philosophic observer had he never written anything else. In 1859 he published his *Origin of Species by Means of Natural Selection*, a work which has gone through many editions at home and abroad, has attracted much attention, and given rise to warm controversy in all civilized countries. It is universally conceded that this treatise displays profound knowledge of the facts of natural science and great powers of generalization. His style is clear and even elegant, his temper is moderate and always courteous, and his statements of fact always accurate. He published a work on the *Fertilization of Orchids* (1862); the *Habits and Movements of Climbing Plants* (1865); *The Variation of Animals and Plants under Domestication* (1868); the *Descent of Man* (1871), which attracted scarcely less attention than the treatise on the *Origin of Species*, and is indeed a continuation of that work. He also published *The Expression of the Emotions in Man and Animals* (1872); *The Effects of Cross and Self Fertilization in the Animal Kingdom* (1876); and *The Formation of Vegetable Mould through the Action of Worms* (1881). Mr. Darwin was a member of many learned societies, and the recipient of numerous medals and other distinctions. He was perhaps equally eminent in geology, zoölogy, and botany. D. Apr. 19, 1882, and was buried in Westminster Abbey. See his *Life and Letters*, by his son Francis Darwin (1887). See Darwinism and Evolution. Revised by David S. Jordan.

Darwin, Erasmus: poet and man of science; grandfather of Charles Darwin: b. near Newark, England, Dec. 12, 1731. He studied at Cambridge, and practiced medicine at Lichfield, from which he removed in 1781 to Derby. He gained distinction as a physiologist, and also as a poet. His *Botanic Garden* (1791), formerly very popular, is a poetical treatise on botany, full of extravagant imagery. Among his works are *Zoönomia, or the Laws of Organic Life* (1793); *Phytologia* (1800); and the *Temple of Nature* (1803). Many of his ideas on physiology contained the germs of important truths. D. near Derby, Apr. 18, 1802.

Darwin, Francis, M. A., F. R. S.: son of Charles Robert Darwin; b. at Down, in Kent, Aug. 16, 1848; educated at Trinity College, Cambridge, and at St. George's Hospital, London; university lecturer in Botany 1884; university reader in Botany 1888; fellow Christ's College 1888; joint author with his father, whose assistant he was 1874–82, of *The Power of Movement in Plants* (1880); author of *Papers on Physiological Botany*; editor of *Life and Letters of Charles Darwin* (1887). C. H. Thurber.

Darwin, George Howard, M. A., F. R. S., LL. D.: scientist; son of Charles Robert Darwin; b. 1845; educated at Trinity College, where he graduated, 1868, as second wrangler; fellow of Trinity College 1868; studied law, but never practiced; contributed to the *Transactions of the Royal Society* a paper *On the Influence of Geological Changes on the Earth's Axis of Rotation* (1876); *On the Remote History of the Earth* (1878); since occupied with physical, mathematical, and astronomical study, with investigations on the pressure of loose sands, on changes in level of the earth's surface and minute earthquakes; assisted Sir William Thompson, 1882, in preparation of new edition of *Thompson and Tait's Natural Philosophy*; elected to the Plumian professorship of Astronomy and Experimental Philosophy at Cambridge, Jan., 1883; member of the council of the meteorological office 1885; frequent contributor to *Nature* and other scientific periodicals.

Darwinism: a term frequently used as synonymous with evolution, but properly more restricted in its meaning. Evolution is the broader term, and implies development by descent wherever it may occur—that law of nature whereby the simple is constantly tending toward the complex, the undifferentiated toward differentiation. The formation of

the solar system from the primordial nebulous matter and the differentiation of the modern Romance languages from the parent Latin are instances of evolution. Darwinism, on the other hand, forms one portion or one aspect of organic evolution. Organic evolution teaches that all living forms have descended by variation from a smaller number of more primitive original forms, while Darwinism is an attempt to explain one part of that process. For a more extended view of Darwinism the reader must refer to the article Evolution, but here it may be briefly summarized as follows: According to Darwin the existence of variation is admitted without much reference to its causes. His great principle is what he has called "natural selection," and what Herbert Spencer has aptly termed the "survival of the fittest." In originating new varieties of plants or new breeds of animals the farmer exercises an *artificial selection*. He takes those individuals which present variations in some desired line, and uses these for reproduction; with the next generation a similar selection is made, and so on until the result is far different from the parent stock. Darwin maintains that a somewhat similar, though not intelligent, selection occurs in nature, those individuals which present some variation which better fits them to their surroundings being more apt to survive than their less favored relatives. That this selection must occur is obvious. The rate of reproduction of any organism is so rapid that were it not checked it would soon completely fill the earth. There is consequently what may be metaphorically called a struggle for existence, not only between individuals of the same species, but between different species as well, and in this struggle it is evident that the fittest must, as a rule, survive. Thus nature exercises a selection and, like the breeder, originates new varieties. The same process carried further produces wider divergences from the parent stock until at last new species and higher groups are differentiated. It must be understood that the initial variations proceed in all directions. One plant may have the advantage through the development of spines; another through the existence of poisonous juices; a third through an inconspicuous habit. So it would follow that these forms must continue their evolution in different directions.

Thus with Darwin (and this is Darwinism) the great idea was that the factors in the origin of species are: animals vary; there is a struggle for existence; nature selects those best fitted for their environment, and these survive. A few years later two other schools arose. Both believe in evolution, but they differ in their ideas as to its methods. Darwin paid little attention to the origin of variation; its existence was enough. He recognized that variation may be spontaneous, i. e. that it may originate in some recondite modification of the germ-cells; and also that it may result from the effects of use and disuse. He regarded the fact of variation as all important, but apparently did not give much consideration to the causes of evolutionary variations. That he saw some of the difficulties connected with the inheritance of acquired characters is shown by his provisional theory of pangenesis. See Heredity.

Under the lead of Prof. August Weismann, of Freiburg (Baden), a third school—sometimes called "Neo-Darwinians"—arose. For a summary of the grounds of their belief the reader is referred to the article Heredity; they believe that those variations which are produced by use and disuse, by environment and by all other than modifications in the germ itself, are incapable of inheritance, and hence can play no part in the evolution of new varieties or higher groups. The variations which can be inherited must arise from and in the germ itself, and hence must be, so far as we can see, largely fortuitous, and by acting upon these, natural selection and heredity produce their results. Opposed to this is the "Neo-Lamarckian" school which believes, with Lamarck, that in evolutionary variation use and disuse and environment are effective causes, and that these "acquired variations" are capable of transmission from one generation to another. (See Lamarckianism.) The struggle between these schools is not over, and it can not be predicted which will prevail. At present the majority of the embryologists are followers of Weismann, while most palæontologists follow Lamarck. For the arguments of those who oppose Darwinism, see Sir J. W. Dawson's article under Evolution.

J. S. Kingsley.

Da'sent, Sir George Webbe, D. C. L.: English scholar and author; b. at St. Vincent, West Indies, in 1820; graduated in 1840 from Magdalen Hall, Oxford; was called to the bar at the Middle Temple in 1852, and appointed civil service commissioner in 1870; was for some years one of the assistant editors of the London *Times*, and became in 1871 editor of *Fraser's Magazine*; translated *The Younger Edda* (1842), and published *The Norsemen in Ireland* (1855); *The Story of Burnt Njal* (1861); *Selection of Norse Tales* (1862), etc.; also edited *An Icelandic-English Dictionary based on the MS. collections of the late Richard Cleasby, enlarged and completed by Gudbrand Vigfusson* (1874). He received the honor of knighthood June 27, 1876, and was an original member of the Royal Commission on Historical Manuscripts. D. June 11, 1896.

Dash'iell, Robert Laurenson, D. D.: clergyman; b. in Salisbury, Md., June 25, 1825; graduated with honor at Dickinson College, 1846; joined the Methodist Baltimore Conference, 1848, and occupied prominent pulpits in the Middle States down to 1868, when he was elected president of Dickinson College, Pa.; resigned in 1872, and same year became corresponding secretary of the Missionary Society of the Methodist Episcopal Church. D. Mar. 8, 1880.

Dash'kof, Ekaterina Romanovna, Princess: a Russian lady eminent for talents and learning; b. of a noble family, Mar. 28, 1743. She became the wife of Prince Dashkof and a friend of the Empress Catharine II. She was one of the chiefs of the conspiracy which dethroned Peter II. Soon after this event she lost the favor of Catharine, and passed several years in a tour through France, Germany, and Italy. Having returned home in 1782, she was appointed president of the Academy of Sciences at St. Petersburg. She was the first president of the Russian Academy, founded in 1784, and superintended the compilation of a great dictionary of the Russian language. D. Jan. 16, 1810. Her autobiography was published in English in 1840.

Dass, daas, Peter: Norwegian poet; b. 1647; parish priest at Alstahoog, in Nordland, from 1689 till his death. His works (*Samlede Skrifter*, edited by A. E. Erichsen, 3 vols., 1874–77) comprise satirical, descriptive, religious, and occasional poems. He was a favorite poet of the Norwegian peasantry throughout the eighteenth century and during the first half of the nineteenth, and his *Nordlands Trompet*, a rhymed description of the whole region included in what is now the bishopric of Tromsø, is still popular. D. Aug., 1708.

G. L. Kittredge.

Da'sya [a mod. quasi-Lat. formation from Gr. δασύς, thick, shaggy]: a genus of red algæ, of the family *Rhodomelaceæ*, nine or ten species of which are found in the U. S., and seven species in the British islands. They have pear-shaped spores, borne in ovate conceptacles upon the smaller branches. The genus includes some very handsome seaweeds.

Dasypodi'dæ [from *Dasypus*, the typical genus; from Gr. δασύς, thick + πούς, ποδός, foot]: a family of edentate mammals comprising the armadillos; characterized by having the back and head protected by bony shields formed of numerous pieces, and the tail encased in bony rings or covered with irregular plates. The teeth are numerous and simple, and, with the exception of *Tatusia*, there is but a single set. The neck vertebræ are short and broad, and the second and third or more are united. The lumbar vertebræ have long processes reaching to the bony shield, the clavicles are well developed, the femur has a third trochanter, and the fore foot has three, four, or five strong claws. By some authorities the genera Chlamydophorus (*q. v.*) and *Tatusia* are made the types of distinct families, leaving the genera *Dasypus*, *Xenurus*, *Priodon*, and *Tolypeutes*. See Armadillo.

F. A. Lucas.

Das'yure [from Gr. δασύς, thick, shaggy, hairy + οὐρά, tail]: the common name for any member of the genus *Dasyurus* and family *Dasyuridæ*; a group of flesh-eating marsupial mammals, which plays much the part among marsupials that the weasels do in the order Carnivora. The dental formula is I. $\frac{4}{3}$, C. $\frac{1}{1}$, Pm. $\frac{3}{2}$, M. $\frac{4}{4} \times 2$, or 42 teeth in all. The dasyures are animals of moderate size, found in Australia, Tasmania, New Guinea, and some of the adjacent islands. Most species are more or less spotted, and, as the name implies, they have bushy tails. The viverrine dasyure (*D. viverrinus*), a typical species, is about 2 feet in total length, gray or brownish-black above, spotted with white on the head and body; light brown or whitish beneath. It is a resident of Tasmania and New South Wales, and is destructive to poultry. See also the articles Tasmanian Devil, Tasmanian Wolf, and Thylacinidæ.

F. A. Lucas.

Dasyuridæ [New Lat., from *Dasyurus*, the typical genus + *idæ*, a zoölogical suffix denoting "family"]: a family of marsupial mammals of Australasia. See THYLACINIDÆ.

Da'ta [things given; neut. plur. of perf. pass. ptc. of Lat. *dare*, give]: things given or admitted; quantities and facts given, known, or admitted, by which to find things or results unknown; in geometry, the quantities or conditions which are assumed to be known in any problem. Thus in the problem, *Given the base, altitude, and area, to construct the triangle*, the data are: 1, that the figure is a triangle; 2, that it has a certain straight line for its base; 3, that its vertex is at a known distance from its base; and 4, that its area has a known magnitude.

Dat'ames: a Persian general and satrap, fourth century B. C.; son of a Carian father and a Scythian mother. His principal fields of action were Asia Minor and Syria. He experienced the fate accorded to many distinguished commanders of antiquity, such as Sertorius, master of Spain eight years in the first century B. C., and Viriathus, second century B. C., and, in modern times, Wallenstein and Guise, when they sought to maintain their independence against despotism, or when they became dangerous to royalty. He is known to modern times only by short notices of Diodorus of Sicily, about 50 B. C., and of Polyen the Macedonian, second century A. D., author of *Strategemata*, and by a very interesting account of him by Cornelius Nepos (first century B. C.). Nepos considers him the most valiant and capable of barbarian generals, with the exception of the two Carthaginians, Hamilcar and Hannibal; as one who owed his success not to the command of great armies, but to an individual ability almost unequaled. The scanty details of his life furnished us justify the belief that in other times he might have proved one of the greatest of military commanders. At first very successful in putting down an extensive confederated revolt, and thereupon invested with the command of the army destined to subject insurgent Egypt, Datames fell into disfavor with the Persian monarch Artaxerxes. Finding himself distrusted and imperiled, he set up for himself, and was victorious over the powerful forces sent against him. Found too great to be conquered, he was betrayed by a friend, and murdered in a conference about 362 B. C. Revised by C. K. ADAMS.

Da'tary [Med. Lat. *data'rius*, deriv. of *datum*, given, the first word in the *date* of papal documents; for example, "Datum Romæ apud Sanctum Petrum," etc., Given at Rome Jan. 1, etc.]: one of the chief officials of the Roman curia. The ordinary graces, *in foro externo*, granted by the pope (benefices, dispensations, etc.) pass through his hands. At present the office is always held by a cardinal, who is entitled pro-datary. It dates in its present form from the thirteenth century. At the death of the pope the activity of the datary's office ceases, all petitions being handed over to the cardinals until the election of a successor. See J. H. Bangen, *Die römische Curie* (Münster, 1854); Bouix, *Tractatus de Curia Romana* (Paris, 1859). J. J. KEANE.

Date [O. Fr. *date* > Mod. Fr. *datte*: Ital. *dattilo* < Lat. *dactylus* = Gr. δάκτυλος, name of the date-fruit; a Semitic loan-word, having originally no connection with the word for finger]: the fruit of one of the palm-trees (*Phœnix dactylifera*) of Southwestern Asia and Northern Africa. It is a tall-growing tree, 100 or more feet in height, with a slender, cylindrical stem, covered with the scars of the fallen leaves, and surmounted by a heavy crown of numerous ascending, spreading, and recurving, pinnately compound leaves. The trees are diœcious, and the flowers are borne in clusters upon long recurving peduncles which arise between the leaves. Each pistillate flower contains three separate pistils, but in ripening only one of the three develops, forming a one-seeded, fleshy fruit, the date of commerce. Dates are highly nutritious, containing 58 per cent. of sugar, besides other digestible substances. They constitute the chief article of food of the inhabitants of the regions where they abound, and immense quantities are annually exported to all parts of the civilized world. In its native region the seeds are ground and used as food for camels and other domestic animals. When roasted the seeds are used as a substitute for coffee under the name of date-coffee. The usefulness of the date-palm is scarcely excelled by any other plant, and we can here do no more than merely mention its most important uses. By pressure the ripe fruits yield a delicious sirup; by distillation of the fermented fruits an alcoholic drink is made; from the sap which exudes upon the removal of the terminal bud "palm wine" is made by fermentation; the succulent terminal bud is edible, and when removed for the purpose of collecting the sap is cooked and eaten; from the fibrous parts of the leaves and stems ropes, baskets, mats, etc., are made; the spongy substance of the trunk contains a starchy and edible substance of which some use is made; and, lastly, the trunk itself is used for posts and beams in the simple structures built by the inhabitants of warm climates. C. E. B.

Date [from Lat. *datum*, given, the first word in the dating phrases, such as *datum Romæ*, etc.]: the exact time when anything is or was or is to be done. The careful observance of dates is of the utmost importance in the writing of history. One of the best works on this subject is *L'Art de vérifier les Dates*, by the Benedictines of St. Maur. See CHRONOLOGY.

Date-line: See CHANGE-OF-DAY LINE in the Appendix.

Date-plum: See DIOSPYROS.

Dath'olite, or **Datolite** [from Gr. δατεῖσθαι, divide + λίθος, stone]: a mineral composed of boro-silicate of calcium with a little water. It occurs in a white opaque massive form and in brilliant crystals, either colorless or of a red, gray, or green tint. It is found in Norway and Italy and in New Jersey and the Lake Superior region.

Datis: a Persian general sent by Darius the First to invade Greece; commanded the army in conjunction with Artaphernes; was defeated at MARATHON (*q. v.*) by Miltiades, and was afterward put to death by the Spartans.

Dative Case: See DECLENSION.

Datiya, da-tee'ya: a town in Bundelkhand, Central India; capital of a feudatory state of the same name; 125 miles S. E. of Agra (see map of N. India, ref. 6–E). It is inclosed by a stone wall 30 feet high. Pop. 30,000.

Datu'ra [from Hindustani *dhāturā*]: a genus of herbs of the family *Solanaceæ*; natives chiefly of warm climates in both hemispheres. *D. stramonium* (thorn-apple, Jamestown or "Jimson" weed of the U. S., where it is naturalized) furnishes the drug STRAMONIUM (*q. v.*). Many species are cultivated in greenhouses for the beauty of their flowers. They all possess narcotic properties similar to those of belladonna.

Daubenton, dō'bäṅ'tōṅ', LOUIS JEAN MARIE, M. D.: naturalist; b. at Montbar, France, May 29, 1716. He studied medicine in Paris, and began in 1742 to collaborate with Buffon upon the first part of his natural history. He was well qualified for this task by his sound judgment, scrupulous accuracy, and patient industry, which enabled him to rectify some of Buffon's errors and hasty theories, and to enrich the work with many new and important facts in the anatomy of animals. In 1745 he was appointed curator and demonstrator of the cabinet of natural history in Paris, of which he had charge for nearly fifty years. He became Professor of Natural History in the College of France in 1778. He contributed many scientific articles to the first *Encyclopédie*, edited by Diderot, and introduced the merino sheep into France. D. in Paris, Jan. 1, 1800. See Cuvier, *Notice sur la Vie de Daubenton*.

Daubento'nia [so named in honor of the French naturalist Daubenton]: the generic name given to the aye-aye (*Chiromys madagascariensis*) by Geoffroy Saint-Hilaire. It has precedence over *Chiromys*, and by the law of priority should be used. F. A. L.

Daubeny, dawb'ni, CHARLES GILES BRIDLE, M. D., F. R. S.: chemist and naturalist; b. at Stratton, England, Feb. 11, 1795. He was for many years Professor of Chemistry, Botany, and Rural Economy in the University of Oxford. He visited the U. S. in 1837. Among his works are a *Description of Active and Extinct Volcanoes, with Remarks on their Origin* (1826); a *Sketch of the Geology of North America*, and *Lectures on Agriculture* (1841). D. Dec. 12, 1867.

Dauber: a name applied to various mud-wasps; hymenopterous insects of the family *Sphegidæ* and the genus *Pelopœus*; natives of various parts of America, some of the species being quite common in the U. S. This name is given on account of the remarkable nest which the mother-insect constructs, bringing lumps of mud in her mouth, which she arranges into cells, inwardly very smooth and regular, but outwardly looking like masses of clay. In these cells she lays her eggs, one in each cell, and with it she seals up a large number of spiders, alive, but paralyzed by her sting. The eggs hatch, the grub feeds on the spiders, goes into the pupa state, and, finally, having burst its cocoon, gnaws through the wall of earth and escapes, a perfect insect.

D'Aubigué, dō'bĕĕn'yā', Jean Henri Merle, D. D.: Swiss divine and historian; b. at Eaux-Vives, near Geneva, Aug. 16, 1794. His father's name was Louis Merle. Having studied theology at Geneva and Berlin (under Neander) he became pastor of the Freneh Protestant ehurch in Hamburg, 1818; court preacher in Brussels, 1823; Professor of Chureh History in the Theologieal Seminary of the Evangelieal Chureh at Geneva, 1831. His principal work is a *History of the Reformation in the Sixteenth Century* (1835), translations of which have obtained extensive eirculation in Great Britain and the U. S. In 1863 he began to publish a *History of the Reformation in Europe in the Time of Calvin*. He also published the *Protector* (*Cromwell*)—*a Vindication* (1848). He is mueh praised for the vivacity of his style, the fervor of his piety, and the pronouneed orthodoxy of his opinions, but he has no standing as an authority. D. in Geneva, Oet. 21, 1872.

D'Aubigué, Théodore Agrippa: See Aubigné, d'.

Daubigny, dō'bĕĕn'yee', Charles François: landscape-painter; b. in Paris, Feb. 15, 1817. Pupil of Edmé Daubigny and of Paul Delaroche; first-class medals, Salons, 1857, 1859, and 1869; offieer Legion of Honor 1874. Daubigny is eommonly associated with the famous Fontainebleau group of painters, just as Corot is sometimes, though neither of them painted in the forest or at Barbizon. They both belong to the same general movement in art as Millet, Rousseau, and Diaz, but Daubigny has gone further in the direetion of absolute truth to nature than any of them. He lived and studied so much out of doors that he has tried in his pietures, more than any of the great landscape-painters of his day, to preserve the actual look of nature. He was not content to use faets for a basis and paint his remembered impressions. Perhaps it was a matter of temperament with him, or possibly he found the results of sueh work as he may have attempted, if he followed the methods of Corot and others who preceded him, less satisfactory than those he achieved when he adhered more closely to his studies from nature. Be that as it may, there is in his work more of the impression of what we fancy we have seen ourselves than there is in the creations of the other great artists, and we are apt to think that Daubigny's landscapes contain more aetual truth than is to be found in any others. But while fidelity to nature's looks is a conspieuous quality in his painting, it by no means overshadows others that are essential in the highest fields of landseape. His work is most highly appreciated by artists, and he is distinetly a "painter's painter." They like his honest direet method, his evident sincerity, and they admire his winning, tender way of depicting Nature, eopying her many moods with a loving hand that fears to add or take away lest her fair beauty be marred. There is no exaggeration, no falsifying in his pictures in one place, or toning down to make them more forceful in another; everything is kept in its just relation to every other thing, and his work seems as absolutely truthful in effect as paint can make it. Onc of the finest of his landscapes is in the collection of John G. Johnson, Philadelphia, representing a view of a town by a riverside; and a small canvas *On the River Oise*, a wonderfully beautiful effect of afternoon sunshine, was in the collection of G. I. Seney (sold in New York, 1891). His pietures are frequently seen in public exhibitions in the U. S., and a large number of excellent canvasses by him are owned in this country. Several works are in the Louvre, and an especially fine one, *A Sluice in the Optevoz Valley*, formerly in the Luxembourg Gallery, is in the Museum at Rouen. Daubigny traveled and studied in Italy when a young man, but painted almost all of his pictures in Franee. He had a studio at Auvers-sur-Oise, another in Paris, and a studio boat in whieh he made leisurely trips along the Seine and the Oise, painting as he traveled. He was an etcher of great talent and left a large number of plates. It may justly be said of him that he never painted a bad picture, and he ranks deservedly among the three or four greatest masters of landseape-painting of his century. An exeellent biographieal sketch of Daubigny was published in the *Century Magazine*, July, 1892. D. in Paris, Feb. 19, 1878.

William A. Coffin.

Daubigny, Charles Pierre (ealled Karl): landscape-painter; son of C. F. Daubigny; b. in Paris, Junc 9, 1846. Pupil of his father; medal, Salon, 1868; third-class medal, Salon, 1874. An excellent painter whose style is individual and whose methods are frank and direet. He painted in eompany with his father in the valleys of the Seine and Oise, and also on the Normandy coasts. One of the best of his works is *The St. Simeon Farm* (1879). D. at Auvers-sur-Oise, May, 1886. W. A. C.

Daubrée, dō'brā', Gabriel Auguste: mining engineer and geologist; member of the Institute; b. at Metz, 1814; from the Polytechnic Sehool and the School of Mines entered the corps of mining engineers in 1834, and was one of the commission to explore Algeria. In 1839 he was Professor of Mineralogy and Geology at the Aeademy of Strassburg and engineer of mines of that residency, and engineer-in-ehief in 1855. In 1861 he was called to Paris as Professor of Geology in the Museum of Natural History; the next year professor in the sehool of mines; in 1867 inspeetor-general of mines; and in 1872 direetor of the sehool of mines. Officer of the Legion of Honor in 1858, he was made grand offieer in 1869. In 1861 Daubrée was eleeted almost unanimously a member of the Institute. He published many memoirs in the *Annales des Mines* and in the *Comptes Rendus* of the Academy. D. in Paris, May 29, 1896. W. R. H.

D'Aubusson, Pierre: See Aubusson, d'.

Daudet, dō'dā', Alphonse: author; b. at Nîmes, Franee, May 13, 1840; settled in Paris in 1857; made his *début* in literature with some poems—*Les Amoureuses* (1858); *La Double Conversion* (1859). In 1864 he became secretary to the Duke of Morny. As a dramatist he aehieved no small suceess—*La dernière idole* (1862); *L'Œillet blanc* (1864); *Le sacrifice* (1869); *Lise Tavernier* (1872), etc. But it is by his prose-writings that he acquired his great fame—*Lettres de mon moulin* (1866); *Lettres à un absent* (1871); *Aventures prodigieuses de Tartarin de Tarascon* (1872); *Contes du lundi* (1873), etc. He is best known by his novels—*Jack* (1876); *Le nabab* (1878); *Les rois en exil* (1880); *Numa Roumestan* (1881); *Sapho* (1884); *Tartarin sur les Alpes* (1885); *La Belle Nivernaise* (1886); *l'Immortel* (1888); *Port-Tarascon; dernières aventures de l'illustre Tartarin* (1890). Several of these books have been dramatized, but without attaining the suceess of the originals. *La Lutte pour la Vie*, amplifying part of the story of *l'Immortel*, has perhaps eome nearest. Daudet was one of the leaders of the naturalistic school in Franee, and in one respect he approached real life nearer than anybody else; several characters in *Le nabab*, *Les rois en exil*, and espeeially in *l'Immortel*, a satiric picture of the Académie Française, are recognized portraits. D. Dee. 16, 1897. See Jules Claretie, *Alphonse Daudet*, in the series Célébrités Contemporaines; also Daudet's own reminiseenees, *Trente ans de Paris, à travers ma vie et mes livres* (1887).

Revised by A. R. Marsh.

Daudet, Louis Marie Ernest: novelist and historian; brother of Alphonse Daudet; b. at Nîmes, Franee, May 31, 1837. He went to Paris in 1857, and, with the exeeption of a year or two of work on journals of the provinees, has lived there ever sinee. From 1860 to 1870 he was a public funetionary, but after 1870 he beeame a reaetionist—now Bonapartist, now Legitimist. He early began to write both novels and historieal works. Among his novels the following are worth mentioning: *Jean le Gueux* (1871); *Les Dames de Ribeaupin* (1872); *Le Roman de Delphine* (1873); *Henriette* (1876); *La Baronne Amalfi* (1877); *Madame Robernier* (1879); *La Carmelite* (1883). Among his historical works are *Le Cardinal Consalvi* (1868); *L'Agonie de la Commune, la France et les Bonapartes* (1871); *Le Ministère de M. de Martignac* (1875); *Le Procès des Ministres* (1877); *Histoire des conspirations royalistes du Midi sous la Révolution* (1881); *Histoire de la Restauration* (1882); *Histoire de l'émigration* (1886, *seq.*); *Les Bourbons et la Russie pendant la Révolution française* (1888). A. R. Marsh.

Daughters of the King: See the Appendix.

Daun, down, Leopold Joseph Maria, Count von: an Austrian general; b. in Vienna, Sept. 25, 1705. He served with distinetion against the Turks, fought in the war of the Austrian suceession, and beeame a field-marshal in 1754. He was eommander-in-chief of the imperial army in the Seven Years' war. On June 18, 1757, he defeated Frederick the Great at Kolin, where the loss of the Prussians was very severe. On Oct. 14, 1758, he gained a victory over Frederick at Hochkirchen, and in the following year, at Maxen, forced Gen. Fink and his whole army to surrender. On Aug. 15, 1760, he was defeated at Liegnitz, and on Nov. 3, 1761, at Torgau. These reverses have been attributed to a eertain dilatoriness in his operations, and a neglect to follow up his successes. He was appointed president of the Aulic eouncil in 1762. D. Feb. 5, 1766.

Daunou, dō′noo′, Pierre Claude François: statesman and author; b. at Boulogne-sur-Mer, France, Aug. 18, 1761. He was elected in 1793 a member of the National Convention, in which he acted with moderation, opposing the execution of Louis XVI. and the proscription of the Girondists. He was the first president of the Council of Five Hundred, and a member of the committee which formed the constitution of the year VIII. (1800). He was editor of the *Journal des Savants* from 1816 to 1838, and became Professor of History in the College of France in 1819. He published an *Essay on the Temporal Power of the Pope* (1810) and a *Course of Historical Studies* (20 vols., 1842, *et seq.*). D. June 20, 1840. See Walckenaer, *Notice sur la Vie de Daunou* (1841).

Dau′phin (Lat. *delphi′nus*): the former title of the eldest son and heir-apparent to the King of France. It was originally the title of the sovereign lords of the province of Dauphiné. In 1349 Humbert, lord of Vienne, dying without issue, bequeathed his possessions to Charles of Valois, on condition that the heir-apparent to the throne of France should bear the title of Dauphin of Vienne. This title was abolished at the revolution of 1830, the last dauphin being the Duke of Angoulême.

Dauphiné, dō′fĕĕ′nā′: a former province in the southeast of France; now comprised in the departments of Drôme, Hautes-Alpes, and Isère; bounded on the E. by Piedmont and Savoy, S. by Provence, and N. and W. by the Rhône; was added to the Roman empire and formed a part successively of the Burgundian kingdom, Carlovingian and German empires. The chief towns were Grenoble, Vienne, Gap, and Valence. Before the end of the twelfth century it was divided into small principalities, of which the Dauphins of Viennois became the most powerful, and extended their authority at the expense of their neighbors. In 1349 it was ceded to the crown of France, and was governed by the king's son as a separate province till 1457 when it was incorporated with the kingdom. Its inhabitants sympathized with the Vaudois and with the Reformers of the sixteenth century, and suffered from persecutions. The province was ravaged in 1692 by the Duke of Savoy and Prince Eugene.

Dauw, or **Burchell's Zebra** [*Equus burchelli*]: a wild ass of Southern Africa, resembling the true zebra, but not so beautiful, its stripes being far less brilliant, and not distributed over the whole body.

Davalos, dăă-vaa′lōs, Gil Ramirez: Spanish soldier; b. at Baeza, in Castile, about 1505. He was a follower of Antonio de Mendoza, who went to Peru as viceroy in 1551; Davalos, accompanying him, was made *corregidor* of Cuzco, and when Giron revolted, in 1553, was seized, deprived of his papers, and expelled from the city. He took part in the campaign which ended in Giron's downfall; was made *justicia mayor* of Quito in 1556; founded Cuenca in 1557, and subdued the Cañares Indians; and in 1558 succeeded his brother, Egidio Ramirez Davalos, as governor of Quijos or the Land of Cinnamon, in the forests about the river Napo. He founded there Baeza, Archidona, and other towns, and formed a flourishing community which was afterward abandoned in great part. In 1561 he retired to Riobamba, near Quito, where, probably, he died.

Herbert H. Smith.

Dav′enant, Sir William: dramatic poet; b. at Oxford, England, in 1605; began to write at an early age, and, after the production of several masques and tragi-comedies, the most famous of which is *The Wits*, he succeeded Ben Jonson as poet-laureate in 1637. He became manager of Drury Lane theater in 1639, but joined the king's side in the civil war and served with distinction throughout the struggle. Taking command of a colonizing expedition to Virginia, he was captured by a government vessel and thrown into prison, where he devoted himself to the composition of his epic *Gondibert*, the best known of his works. His release, due, it is said, to the intercession of the poet Milton, was followed by the production of a number of pieces to which he gave the name of operas, and of which only one, *The Cruelty of the Spaniards in Peru*, had merit enough to survive. After the Restoration his prosperity returned, and he enjoyed the favor of the court until his death in 1668. His writings mark a revulsion from the romanticism of the Elizabethan age without presenting anything desirable in its place, and though *Gondibert* contains many striking and elegant lines it is generally dull and cumbrous in style, while his other poems, especially his plays, are artificial and unsuited to the modern taste. A collection of his plays, with a memoir, edited by Logan and Maidment, was published at Edinburgh (5 vols., 1872–74).

Davenport: city, river-port, and important railway center; capital of Scott co., Ia. (for location of county, see map of Iowa, ref. 5–L): pleasantly situated on the Mississippi at the foot of the Upper Rapids; 330 miles above St. Louis and 184 miles W. by S. from Chicago. It occupies the base and higher parts of a bluff which rises gradually and extends along the river 3 miles, and lies opposite the western terminus of the Hennepin Canal, now being built to connect the Mississippi river with the Great Lakes. A fine iron railway and carriage bridge across the Mississippi river, built by the U. S. Government and the Chicago, Rock Island and Pacific R. R. Company, at a cost of $1,200,000, connects Davenport with Rock Island, containing the great central armory and arsenal of the U. S., and with the city of Rock Island, on the Illinois shore.

Davenport was founded in 1835. It has thirty churches, a public library, Academy of Natural Sciences, founded in 1867, whose proceedings are published regularly, and which possesses a scientific library and a very fine collection of relics of the ancient mound-builders of the Mississippi valley, an imposing Masonic Temple, St. Ambrose College, Kemper Hall, Griswold College, St. Katharine's Hall, College of the Immaculate Conception, two large business colleges, complete system of graded and parochial schools, two fine opera-houses, and new U. S. Government building.

Manufactures.—The census of 1890 shows 463 manufacturing establishments here; capital, $8,283,078; persons employed, 5,060; wages paid, $2,170,510; cost of material used, $5,852,527; value of products, $9,944,709. The flour and grain business is important, and lumber, agricultural machinery, farming tools, woolen goods, glucose, maccaroni, vermicelli, barrels, furniture, cordage, vinegar, paints, watches, canned goods, clothing, pottery, carriages, steam-engines and machinery, cigars, etc., are among the manufactured products.

Water-works, etc.—The city is supplied by an extensive system of water-works, has fire-alarm telegraph, paid fire department, telephone connections, electric street railway lines, and gas-works. Davenport is in the midst of extensive coal-fields, and is the market for a large and highly cultivated farming region. It is the see city of the Episcopal Church in Iowa and of the Davenport diocese of the Roman Catholic Church. Pop. (1870) 20,038; (1880) 21,831; (1890) 26,872; (1900) 35,254. Henry J. Denison.

Davenport, Edward Loomis: actor; b. in Boston, Mass., Nov. 15, 1814; made his first appearance at Providence, R. I., in 1836; became deservedly popular both in the U. S. and in Great Britain, where he acted from 1847 till 1854; from 1873 on acted in New York; married in 1849 Fanny Elizabeth Vining, an English actress. D. in Canton, Pa., Sept. 1, 1877.

Davenport, Fanny Lily Gipsy: actress; b. in London, Apr. 10, 1850; daughter of Edward L. Davenport, the actor. Fanny Davenport made her first appearance at the Howard Athenæum in Boston as the child in *Metamora*; appeared in New York as the King of Spain in *Faint Heart Never Won Fair Lady*, on Feb. 14, 1862, at Niblo's Garden; played in Boston and Philadelphia, and under the management of Augustin Daly at the Fifth Avenue theater, New York, in 1869. She personated a large number of different characters, among them Mabel Renfrew in *Pique*, which ran for 250 nights. She made many starring tours throughout the U. S., and achieved success in *Cleopatra* in Sardou's play of that name. She was married to Edwin H. Price in 1879, but was divorced, and married Melbourne McDowell, an actor of leading *rôles*. D. in Duxbury, Mass., Sept. 26, 1898. B. B. Valentine.

Davenport, Ira: politician; b. at Hornellsville, N. Y., June 28, 1841; educated at Bath, Steuben co., N. Y., and at New Haven, Conn.; elected to New York Senate in 1877, and re-elected in 1879; served during both terms as chairman of committee on commerce and navigation; in 1881 he was elected controller of the State of New York, and in 1884 and 1886 member of Congress. In 1885 he was the Republican candidate for Governor of New York, but was not elected.

Davenport, John, B. D.: Puritan divine and colonist; b. at Coventry, England, in 1597; educated at Oxford; entered the Anglican priesthood and became minister of St.

Stephen's church, London. In consequence of his Puritanical principles and practice he was obliged to leave the Established Church and in 1633 removed to Holland, returning in 1635 to England, where he aided in obtaining the patent of the Massachusetts colony. In 1637 he went to Boston, Massachusetts Bay, and in 1638 became one of the founders of the New Haven colony. In 1639 he became one of the "seven pillars," as the governing body of the settlement was called, and in 1660 he sheltered Goffe and Whalley, the regicides. He opposed the union of the colonies of New Haven and Hartford, and chiefly for this reason accepted a call to the First church of Boston, over which he was installed Dec. 9, 1668. Published *A Discourse about Civil Government in a New Plantation* (1673) and other works. D. of apoplexy Mar. 15, 1670, and was buried in the tomb of his friend John Cotton.

David: chief town of the district of Chiriqui, department of Panama, Colombia; on one of the narrowest parts of the Isthmus of Panama, near the boundary of Costa Rica (see map of Central America, ref. 10–K). It is on a river about 10 miles from the Pacific coast, in a rich alluvial plain, and near the extinct volcano of Chiriqui. A coal field extends nearly across the isthmus in the vicinity of David. It has considerable trade. Pop. about 9,000. M. W. H.

David (in Heb. דוד, beloved; Gr. Δαβίδ, or Δανίδ; Arab. *Dâood*): one of the most remarkable characters in history; a son of Jesse; b. at Bethlehem in Judæa about 1085 B. C., according to the chronology of Ussher. In his youth he followed the occupation of a shepherd, and he acquired great skill as a musician. He was received into the household of Saul, King of Israel, who, we are told, was troubled with an "evil spirit." David, by playing upon the harp, soothed and "refreshed" Saul, and "the evil spirit departed from him." Not long afterward, David slew in single combat a Philistine giant named Goliath, and, as a reward for later exploits, received Michal, Saul's daughter, in marriage. But Saul was offended by the praises which David received for his prowess, and not only regarded his son-in-law with bitter jealousy, but made repeated attempts upon his life. David was obliged to fly for safety to Achish, King of Gath. When David was thirty years old Saul was slain in a battle with the Philistines, and David was made king of the tribe of Judah, reigning at Hebron for seven years and a half, while Ishbosheth, Saul's son, was in power on the east side of the Jordan, and for two years was obeyed by all the tribes except Judah. After the murder of Ishbosheth, David became king of the whole nation. He was victorious in all his wars, and under his sway the kingdom of Israel acquired great prosperity and power. One of his sorest trials was the rebellion and death of his favorite son, Absalom. David died in 1015 B. C., and Solomon, his son, succeeded to the throne. In David all the feelings and passions appear to have been singularly intense and powerful, and by them he was again and again betrayed into great faults and even crimes. Yet his character, on a whole, exhibits a rare magnanimity, as shown in his sparing Saul, his bitterest enemy, when that king was completely in his power. (See 1 Sam. xxiv.) It should be borne in mind that David was not subjected to the powerful restraints which public opinion exercises in some directions on modern European monarchs. His fear of God and his generous feelings were the only checks to his mighty passions and that license which long-continued success and a power all but unlimited in his own dominions tended to foster. If we consider these things, we shall probably find few sovereigns, even in the most civilized times, possessing despotic power, whose characters will bear a favorable comparison with that of David. The Bible account of David, as traditionally interpreted, is perhaps self-contradictory; but it becomes consistent when due attention is paid to such chronological details as those given in 1 Chron. xiii. 5, xxvi. 31; 2 Sam. xv. 7, etc. As a writer of religious poetry, and especially of that kind which comes home to the feelings of all sorely tried hearts, David has no equal among the poets of the human race. His name is in the title of 73 of our 150 Psalms, and yet others are attributed to him by the books of Chronicles and by the New Testament. For an account of the Psalter and of commentaries and others works upon it, see PSALMS.

Revised by WILLIS J. BEECHER.

David I.: King of Scotland; sixth son of Malcolm III.; b. 1084. He married, in 1110, Maud, a great-niece of William the Conqueror. He succeeded his brother, Alexander I., in 1124, and swore to maintain the right of his niece Matilda to the throne of England in case her father, Henry I., left no male issue. Henry died in 1135, and David afterward waged war against Stephen, who disputed her claim to the throne. David invaded England, and was defeated at the "Battle of the Standard" near Northallerton in 1138. He promoted manufactures, education, and civilization. In his reign the feudal system was placed on a firm basis in Scotland, and through his efforts the Celtic and Anglo-Saxon elements of the kingdom were brought into more harmonious relations. As a wise law-giver and zealous patron of the Church he holds a foremost place among the early Scottish kings. Though never formally canonized he has often received the title of saint, and his name figures in the calendar prefixed to Laud's Prayer-book for Scotland (1657). He died in 1153, and left the throne to his grandson, Malcolm IV.

David II., or **David Bruce**: King of Scotland; b. in 1323; a son of Robert Bruce, whom he succeeded in 1329. His kingdom was invaded in 1332 by Edward Baliol, who defeated the army of David in the battle of Dupplin Moor, and in 1333 the Scotch were again routed at Halidon Hill. The king was expelled, and retired to France, but his subjects continued to fight for him, and he recovered the throne in 1342. Having invaded England in 1346, he was defeated at Neville's Cross, captured, and detained until 1357. From that time till his death in 1371 his base subservience to the English throne placed his kingdom in a condition of dependence.

David, daă'veed', FÉLICIEN CÉSAR: composer; b. at Cadenet, Vaucluse, France, Mar. 8, 1810; d. Aug. 29, 1876. He wrote a number of operas, symphonies, etc., but his fame rests chiefly on the symphonic ode entitled *The Desert*, for orchestra and male voices.

David, daa'vit, FERDINAND: violin-player and teacher; b. in Hamburg, Germany, Jan. 19, 1810. He was a pupil of Spohr and an intimate friend of Mendelssohn. He was greatly beloved by his pupils, among whom are a large number of celebrities, the most eminent being Joachim and Wilhelmj. He revived many works of the old Italian, German, and French schools, which he edited with accompaniments, bowings, marks of expressions, etc., and was sought for by publishers to edit all the later critical editions of the violin classics. D. in Leipzig, July 18, 1873.

DUDLEY BUCK.

David, daă'veed', JACQUES LOUIS: historical painter; b. in Paris, Aug. 31, 1748; pupil of Vien; Prix de Rome 1774; commander Legion of Honor. He was the recognized head of the French school during the first empire. His style is classical in the extreme, and he considered truth to nature as of secondary importance compared with the conventional forms of the antique. His principles were combated by Ingres, and the revolt against classicalism was carried on by Delacroix and Géricault, the chiefs of "the men of 1830." A portrait by David of Madame Récamier, in the Louvre, is one of the best works he produced in that branch of art, in which he was highly successful. Several of his most important compositions are in the Versailles Museum, including the *Coronation of Napoleon and Josephine*. D. in Brussels, Dec. 29, 1825. W. A. C.

David, JÉRÔME FRÉDÉRIC PAUL, Baron: French politician; b. in Rome, June 30, 1823; a grandson of Jacques Louis David; in 1859 became a member of the Corps Législatif and a leader of the ultra-Bonapartist party; was in 1867, and again in 1869, vice-president of the Corps Législatif. He was minister of public works in the cabinet of Count Palikao, 1870. He wrote *Réflexions et discours sur la propriété chez les Arabs* (1862). D. at Langon, Gironde, Jan. 28, 1882.

David, LAURENT OLIVIER: See the Appendix.

David, PIERRE JEAN, known as **David d'Angers**: sculptor; b. at Angers, France, Mar. 12, 1789. He gained at Paris the first prize (with a pension) in 1811, and then went to Rome to pursue his studies. He formed a friendship with Canova, returned to France in 1816, and produced a statue of the great Prince of Condé, by which he acquired a high reputation. In 1826 he became a member of the Institute. Soon after the revolution of 1830 he was employed by the government to fill the pediment of the Panthcon with sculptures. Among his works are the statue of the young drummer-boy Barra, busts of Washington, La Fayette, Arago, Goethe, and Lamartine, and statues of Cuvier, Racine, and Jefferson. He also made a large number of portraits in bas-relief, including many of the most celebrated

men and women of his time. These bas-reliefs are among the finest things of their kind produced since the Italian medals of the early Renaissance. He was a republican member of the National Assembly in 1848. D. in Paris, Jan. 5, 1856.

David (Welsh, *Dewi*), Saint: patron saint of Wales. The exact dates of his birth and death are involved in obscurity, though his life can be located in the sixth century. The best historical account states that he was the son of Sandde or Xantus, Prince of Ceretica (Cardiganshire), and was born at Hen-Menen, or Menevia (now St. David's). He founded a monastery in the vale of Rhos, became a very famous theologian, and ultimately founded a see at Menevia. He was canonized by Pope Calixtus I. in the twelfth century. Mar. 1 is celebrated as his festival.

David City: city and railway junction; capital of Butler co., Neb. (for location of county, see map of Nebraska, ref. 10–G); situated in a farming section, 56 miles N. W. of Lincoln, Neb. Pop. (1880) 1,000; (1890) 2,028; (1900) 1,845.

Davidists, David-Georgians, or **Jo'rists**: a sect founded by David George or Joris, otherwise called John of Bruges, who was born at Bruges in Belgium, 1501, settled in Delft as glass-painter 1524; became a Lutheran, and for an attack upon a religious procession was banished for three years 1528; returned in 1536, and established a sect. He pretended to be the Messiah, denied the resurrection, and held various heretical opinions. The sect existed in Holland nearly a century after his death. But he fled to avoid persecution in 1544, and lived quietly in Basel under the pseudonym of John of Bruges, as a member of the Reformed Church, unsuspected by the magistracy of being the notorious sectary. D. in Basel, Aug. 25, 1556. In 1559 the truth came out, whereupon his body was exhumed and burned.

Davidson, Andrew Bruce, D. D., LL. D.: Old Testament scholar of the Free Church of Scotland; b. in Aberdeenshire, Scotland, 1831; educated at Marischal College, Aberdeen, and at the Free Church College, Edinburgh; became Professor of Hebrew and Old Testament Exegesis in New College, Edinburgh, 1863. In the revision of the English Bible he was a member of the Old Testament company of revisers. He published a commentary on Job (1862); *An Introductory Hebrew Grammar* (1874), which has passed through several editions; *The Epistle to the Hebrews* in Clark's *Handbooks for Bible Classes* (1882); *Job* and *Ezekiel* in *Cambridge Bible for Schools* (1884). Willis J. Beecher.

Davidson, Charles, Ph. D.: author and teacher; b. at Streetsboro, O., July 29, 1852; educated at Iowa College (A. B. 1875, A. M. 1877) and Yale University (Ph. D. 1892); principal of Minneapolis Academy 1879–84; master in English, Belmont School, Belmont, Cal., 1888–. He has published *The Phonology of the Stressed Vowels of Béowulf* in *Publications of the Modern Language Association*, vol. vi., No. 283; *The Difference between the Scribes of Béowulf* in *Modern Language Notes*, vol. v., No. 2; *English in the Secondary Schools* in *School and College*, vol. i., No. 10; *Studies in the English Mystery Plays*, published by Yale University.

Davidson, George, A. M., Ph. D.: astronomer; b. in Nottingham, England, May 9, 1825, of Scottish parents; removed to the U. S. in 1832; graduated in 1845 at the Central High School of Philadelphia; entered the U. S. Coast Survey; served in the States bordering the Atlantic and Gulf coasts until 1850, when selected to take charge of a party to the Pacific coast; worked continuously upon the western coast, except during the civil war, when he served on the Atlantic and Gulf coasts; was appointed chief engineer of an expedition for the survey of a ship-canal route across the Isthmus of Darien; in 1867 made a geographical reconnoissance of the coast of Alaska, and reported upon its products, etc., to Congress; in 1868 returned to the Pacific coast, and had charge of the field-work of the parties there; in 1869 brought the San Francisco observatory in telegraphic longitude connection with Greenwich; in 1869 took charge of the expedition to Alaska to observe the total solar eclipse of August; in 1873 determined the 120th meridian; in 1874 conducted the U. S. transit-of-Venus party to Japan; at Nagasaki connected the American and French transit-of-Venus stations by triangulation; visited China, India, Egypt, and Europe for scientific study, the results of which were embodied in a special report to the superintendent of the Coast Survey; returned to the Pacific coast to take charge of the telegraph-longitude work and of the main triangulation and astronomical party carrying the geodetic work across the continent; in 1880 was in charge of the party to observe the transit of Venus in New Mexico; regent of the University of California 1877–84; published works on transit instruments and observations, irrigation, harbor and river improvements, and communications in the *Proceedings* of the California Academy of Sciences, of which he was president 1871–86.

Davidson, James Wood: See the Appendix.

Davidson, Leonidas Heber: See the Appendix.

Davidson, Lucretia Maria: See the Appendix.

Davidson, Margaret Miller: See the Appendix.

Davidson, Robert, D. D.: clergyman; b. in Carlisle, Pa., Feb. 23, 1808; graduated at Dickinson College in 1828, and at Princeton Theological Seminary in 1831; Presbyterian pastor in Lexington, Ky., 1832; president of Transylvania University, Ky., 1840; pastor in New Brunswick, New York, Huntington (L. I.), and Philadelphia. Among his writings are *History of the Presbyterian Church in Kentucky* (1847); *Elijah, a Sacred Drama, and other Poems* (1861); *The Christ of God* (1870). D. Apr. 6, 1876.

Davidson, Samuel, D. D., LL. D.: biblical critic; b. in Kellswater, near Ballymena, Ireland, Sept. 23, 1807; studied at the Royal College of Belfast, where he became Professor of Biblical Criticism and Literature in 1835; became in 1842 Professor of Biblical Literature and Oriental Languages at Lancashire Independent College, but resigned in 1857 and settled in London. Among his works are *Canon of the Bible* (3d ed. 1880); *Introduction to the Old Testament* (1862); *Introduction to the New Testament* (1882); *The Doctrine of Last Things in the New Testament* (1883). D. April 1, 1898.

Davidson, Thomas, LL. D., F. R. S., F. G. S.: palæontologist; b. in Edinburgh, Scotland, May 17, 1817; educated in France and Italy in both science and art; in 1858 became honorary secretary of the Geological Society of London, and in 1865 received from its council the Wollaston gold medal; in 1868 received a Silurian medal for his *Illustrations and History of Silurian Life*; in 1870 was awarded the gold medal of the Royal Society, and in 1871 received a presentation from the Palæontographical Society; twice served as vice-president of section C (British Association), and was a member of the general committee. His chief work was *British Fossil Brachiopoda* (5 vols.). D. Oct. 16, 1885.

Davidson, Thomas, M. A.: scholar; b. Oct. 25, 1840, near Fetterangus, parish of Deer, Aberdeenshire, Scotland; graduated with highest classical honors and the Simpson Greek prize at Aberdeen in 1860; was for several years rector of the Grammar (Latin) School of Old Aberdeen, and subsequently master in several English schools; spent considerable time in France and Germany; went to Canada in 1866 and to the U. S. in 1867, and after spending eight years in St. Louis removed to Cambridge, Mass., in 1875. Mr. Davidson has contributed to various periodicals numerous philological and philosophical articles. After a residence of several years in Italy he published *Rosmini's Philosophical System* (1882), and an English translation of *Rosmini's Psychology*; *The Parthenon Frieze and other Essays* (1882); translation of Seartazzini's *Handbook to Dante* (1887); *Prolegomena to Tennyson's In Memoriam* (1889); *Aristotle and Ancient Educational Ideals* (1892); translation of the eleventh book of *Aristotle's Metaphysics* (*Jour. Spec. Philos.*, 1892). D. in Montreal, Canada, Sept. 14, 1900. Revised by W. T. Harris.

Davidson, William: soldier; b. in Lancaster co., Pa., 1746. He was educated in Charlotte Academy, North Carolina, and served as a major in Washington's army until 1779, when he was sent to re-enforce the army of Lincoln. In an engagement at Calson's Mill he was severely wounded, but was nevertheless able to take the field again a few months later on as brigadier-general. He was detached to follow the movements of Cornwallis, and if possible intercept his progress. On Feb. 1, 1781, Cornwallis proposed to cross the Catawba at Cowan's Ford. To prevent the crossing was impossible, and in the fight Davidson was killed. Davidson College, N. C., was named in his honor.

Davidson College: an institution of learning in Mecklenburg co., N. C.; founded in 1837, on an estate given for the purpose by William Lee Davidson, son of Gen. William Davidson, for whom the college was named. It was further endowed by a munificent gift of $258,000 from Mr. Maxwell Chambers, of Salisbury, N. C. It is under the control of the Presbyterian denomination, all the presbyteries of North Carolina, South Carolina, Georgia, and Florida being repre-

sented on its board of trustees. In 1900 the total number of graduates since organization was 818; number of students, 170; number of instructors, 10; number of volumes in library, 12,000. Rev. J. B. Shearer, D. D., is president.

Davies, Charles, LL. D.: U. S. military officer and mathematician; b. Jan. 22, 1798, in Washington, Conn.; graduated at West Point in 1815. After a year in garrison at New England posts, he resigned Dec. 1, 1816, and was attached to the Military Academy as assistant professor till May 1, 1823, when he was appointed Professor of Mathematics, holding his position till May 31, 1837, when he again resigned for a like position in Trinity College, Hartford, Conn. He was appointed paymaster U. S. army Nov. 17, 1841, holding office till Sept. 30, 1845, and was subsequently Professor of Mathematics and Philosophy in the University of New York 1848–49, and of Higher Mathematics in Columbia College, New York city, 1857–65. After leaving West Point in 1837 he devoted most of his time and talents to the preparation of a complete series of mathematical text-books, adopted largely in public schools. He was a member of several scientific and educational associations. D. at Fishkill Landing, N. Y., Sept. 18, 1876.

Davies, Henry Eugene, Jr.: lawyer and general; b. in New York, July 2, 1836; educated at Harvard, Williams, and Columbia Colleges; studied law, and was admitted to the bar in 1857. In April, 1861, he entered the army as captain Fifth New York Volunteers; was transferred July, 1861, as major to the Second New York Cavalry, of which regiment he subsequently became colonel, remaining in command till Sept., 1863, when he was commissioned a brigadier-general of volunteers, and assigned to a command in the cavalry corps of the Army of the Potomac, serving with distinction till the close of the war (brevet major-general of volunteers Oct., 1864). In June, 1865, he was made a major-general, and assigned to the command of the middle district of Alabama, which he held till Jan. 1, 1866, when he resigned. He was public administrator of the city of New York from Jan., 1866, to Jan., 1869, and assistant district attorney of the southern district of New York from July 20, 1870, to Dec. 31, 1872. D. at Middleboro, Mass., Sept. 6, 1894.

Davies, Sir John: poet and judge; b. in Wiltshire, England, in 1570; educated at Oxford. He was appointed solicitor-general of Ireland in 1603, and published in 1612 *A Discourse of the True Reasons Why Ireland has Never been Entirely Subdued*, an able work. In 1620 he was elected a member of the English Parliament. His chief poem, entitled *Nosce Teipsum* (1599), is a good type of the intellectual or metaphysical style of poetry, and from its clear and condensed expression of abstract thought has been likened to Pope's *Essay on Man*. Its influence can be traced in the writings of Sir William Davenant (*q. v.*) and other writers of philosophic verse. He became lord chief justice in 1626, and died Dec. 7, in the same year.

Davies, Louis Henry: member of Canadian Parliament; b. at Charlottetown, P. E. I., May 4, 1845, and educated at Prince of Wales College. He was admitted to the bar in 1866; has been solicitor-general, premier, and attorney-general of Prince Edward Island; entered the Dominion Parliament in 1882, and has been returned at each subsequent election up to and including that of 1891. He was one of the Canadian counsel before the International Fishery Commission at Halifax in 1877, and is now (1898) president of the Merchants' Bank of Prince Edward Island.

Neil Macdonald.

Davies, Samuel, D. D.: Presbyterian divine of Welsh descent; b. near Summit Ridge, Newcastle co., Del., Nov. 3, 1724. In 1747 he was ordained as an evangelist, and spent some years in missionary work in Hanover co., Va., organizing the first presbytery in Virginia in 1755. He was one of the founders of the College of New Jersey, and succeeded Jonathan Edwards as president of it in 1759. He was noted for his eloquence as a preacher. A collection of his sermons was published in London soon after his death. The last American edition, in three volumes (1851), contains an essay on the life and times of the author by Rev. Albert Barnes. D. in Princeton, N. J., Feb. 4, 1761.

Davies, Thomas: author of the *Life of David Garrick* (1780); b. probably in 1712; studied at Edinburgh, and became an unsuccessful actor in London, where he was also a bookseller and publisher. He was a friend of Dr. Samuel Johnson, who was warmly attached to him. Attacked by Churchill in the *Rosciad*, he was compelled by ridicule to leave the stage. D. in 1785. See Boswell's *Life of Johnson*.

Davila, or **De Avila**, dā-aa′vĕĕ-lăă, Alonzo: a Spanish soldier; b. about 1485. He went to America, and in 1518 was in Cuba, where he joined the expedition of Grijalva to the coast of Mexico, commanding one of his ships. Returning to Cuba (1519) he took service with Hernando Cortés, and during the march to Mexico was one of his most trusted captains. In 1520 he marched with Cortés against Narvaez, and subsequently, it would appear, was employed as an agent to the audience of San Domingo, where he obtained for Cortés authority to conquer and govern all of New Spain. Returning to Mexico, Davila was sent to Spain with the treasure which had been collected, and important dispatches (June, 1522). Near the Azores his ships were captured by French corsairs; all the treasure was lost, and Davila himself was held a prisoner for several years, though he succeeded in sending his dispatches to Spain. In the end he was ransomed, and returning to Spain was appointed *contador* of Yucatan, a province which had not yet been conquered. Montejo, the newly appointed governor of Yucatan, had equipped an expedition to take possession of his domain, and Davila accompanied him as second in command (1527). Soon after they arrived there Montejo sent him to a region on the west coast, in search of gold which had been reported; there his headstrong proceedings provoked conflicts with the Indians, Davila was unable to return, and after terrible sufferings made his way to Truxillo in Honduras. He subsequently rejoined Montejo, and in 1537 took part in another expedition to Yucatan. Of his subsequent career nothing is known.

Herbert H. Smith.

Davila, or **De Avila**, Alonzo: nephew of the soldier; b. in Mexico city about 1540. In 1566 he and his younger brother, Gil Gonzalez Davila, were accused of plotting to overthrow the government, murder the members of the audience, and make Martin Cortés (the Marques del Valle) King of New Spain. It is doubtful if such a scheme was ever seriously contemplated, or that the Davilas were guilty of anything more than discontent and grumbling; but they were tried, condemned, and beheaded at Mexico, Aug. 3, 1566. See Cortés, Martin.

Herbert H. Smith.

Davila, or **De Avila**, Gil Gonzalez: Spanish historian; b. at Avila, 1570. He studied at Rome, subsequently had a minor ecclesiastical office at Salamanca, and in 1612 was made royal chronicler of Castile. Among his works are *Vida del rey Henrique 3°* (1638) and *Teatro eclesiástico de las iglesias de las Indias occidentales* (1645 and 1649). D. at Madrid, 1658.

H. H. S.

Davila, Pedro Arias: See Pedrarias.

Davila y Padilla, Agustin: Mexican historian; b. in the city of Mexico, 1562. He entered the Dominican order in 1579, and was prior of the convent of Puebla de los Angeles in Tlascala; he was also a noted lecturer on philosophy and theology. In 1599 he visited Spain and Rome on business of his order, and was appointed Archbishop of Santo Domingo the same year. D. at Santo Domingo, 1604. His *Historia de la provincia de Santiago de Mejico* was first published at Madrid, 1596. There are later editions, that of Valladolid, 1634, having the title *Varia Historia de la Nueva España y Florida*. The work is primarily a history of the Dominicans in Mexico, but contains much of general interest.

Herbert H. Smith.

Davin, Nicholas Flood: Canadian author; b. at Kilfinane, Ireland, Jan. 13, 1843; educated privately and at Queen's College, Cork. He was admitted to the English bar in 1868, and was correspondent for the London *Standard* during the Franco-German war. He was sent to Washington, D. C., by the Canadian Government in 1879 to inquire into the system of managing Indian industrial schools; a secretary to the royal commission respecting the Pacific Railway 1880–81, and a delegate to Ottawa in 1884 to represent the requirements of the Northwest before the Dominion Government. He was elected to Parliament in 1887 and again in 1891. He established the Regina *Leader* in 1883. Among his works are *The Irishman in Canada*; *Eos: an Epic of the Dawn, and other Poems*; *British versus American Civilization*; *The Earl of Beaconsfield*; *Culture and Practical Power*; and *Ireland and the Empire*.

Davis, Andrew Jackson: See the Appendix.

Davis, Charles H.: landscape-painter; b. at Amesbury, Mass., Jan. 7, 1856. Pupil of Grundman, Boston, and Boulanger and Lefebvre, Paris; member Society of American

Artists 1886; honorable mention, Paris Salon, 1887; second-class medal, Paris Exposition, 1888; Palmer prize for landscape, Chicago Exposition, 1890; prize of $2,000, American Art Association (not a professional organization), 1887. His work is truthful in effect and good in color. His *Late Afternoon* is in the Union League Club, New York. He resided in Normandy for several years and painted there up to 1891, when he returned to the U. S. W. A. C.

Davis, Charles Henry, LL. D.: rear-admiral U. S. navy; b. in Boston, Mass., Jan. 16, 1807; entered the navy as midshipman Aug. 12, 1823. He was superintendent of the American *Nautical Almanac* 1849–56, and again 1859–61. In 1861 he was a member of a board of officers assembled at Washington to inquire into and report upon the condition of the Southern coast, its harbors and inlets, with a view to offensive operations on the part of the Government. This led to the organization of the expedition against Port Royal, in which he bore a conspicuous part as chief of staff. On May 9, 1862, Davis relieved Flag-officer Foote of the command of the Western flotilla off Fort Pillow, and on the following day beat off a squadron of eight ironclads, which had steamed up the Mississippi and attacked him. The vessels with Davis at the time were seven in number. The action was a spirited one, and lasted nearly an hour; three of the hostile gunboats were disabled, but, taking refuge under the guns of Fort Pillow, could not be captured. On June 5 Fort Pillow was abandoned by the Confederates, and on the 8th Davis fell in with their ironclads and rams opposite the city of Memphis. A running fight ensued, resulting in the capture of all the Confederate vessels but one, and the surrender of Memphis. For his services during the civil war Davis received the thanks of Congress, and was made a rear-admiral. On his return from the Mississippi he was appointed chief of the bureau of navigation, and in 1865 superintendent of the Naval Observatory, in which capacity he served for two years. In 1870 he was appointed to the command of the U. S. navy-yard at Norfolk, Va. He was reappointed superintendent of the observatory, and died there Feb. 18, 1877.

Davis, Cushman Kellogg, LL. D.: U. S. Senator; b. at Henderson, N. Y., June 16, 1838; A. B. University of Michigan 1857; studied law; first lieutenant Twenty-eighth Wisconsin Infantry 1862–64; U. S. district attorney for Minnesota 1868–73; Governor of Minnesota 1874–75; took his seat in the U. S. Senate as Republican Mar. 4, 1887; member of the peace commission 1898. D. Nov. 27, 1900.

Davis, David, LL. D.: jurist; b. in Cecil co., Md., Mar. 9, 1815; educated at Kenyon College, O.; studied law with Judge Bishop in Lenox, Mass., and in the Law School at New Haven, Conn. In 1836 he settled in Bloomington, Ill., where he resided many years; he was elected to the lower house of the Illinois Legislature 1844–45; to the constitutional convention which framed a new Constitution for the State 1847; elected judge of the eighth judicial circuit of Illinois in 1848; re-elected in 1855, and again in 1861. While serving this last term he was appointed by President Lincoln an associate justice of the Supreme Court of the U. S. Oct. 8, 1862. He resigned as U. S. judge, and was elected U. S. Senator from Illinois for the full term 1877–83; president *pro tem.* of U. S. Senate Oct. 13, 1881–Mar. 3, 1883. D. in Bloomington, Ill., June 26, 1886.

Davis, Emerson, D. D.: Congregational divine and author; b. at Ware, Mass., July 15, 1798; graduated at Williams College in 1821. He became in 1836 pastor of the First Congregational church in Westfield, where he remained for life. He exerted a wide influence in educational affairs. He was vice-president of Williams College from 1861 to 1868. He published *History of Westfield* (1826); *The Teacher Taught* (Boston, 1839); *The Half Century* (1851), etc. D. at Westfield, Mass., June 8, 1866.

Davis, Col. George R.: director-general of the World's Columbian Exposition; b. at Palmer, Mass., in 1840; educated at Williston Seminary; entered the army in 1862; became captain and afterward major of the Third Rhode Island Cavalry, and commanded the regiment in many important battles until the close of the war; was then transferred to the department of Missouri, and served under Gen. Sheridan and Gen. Custer; resigned from the army in 1871; went to Chicago and became agent of the Hartford Insurance Company; elected to Congress in 1878 as a Republican, and re-elected to the two succeeding Congresses; treasurer of Cook co., Ill., in 1886. D. Nov. 25, 1899.

Davis, Henry, D. D.: Presbyterian divine; b. at East Hampton, N. Y., Sept. 15, 1771. He graduated at Yale 1796; was a tutor in Williams (1796–98) and Yale (1799–1803) Colleges; Professor of Greek at Union College, Schenectady, N. Y., 1806–09; president of Middlebury College, Vt., 1809–17; president of Hamilton College, Clinton, N. Y., 1817–33. He was a preacher of very eminent ability, one of the founders of Auburn Theological Seminary, and an active friend of foreign missions. D. at Clinton, N. Y., Mar. 8, 1852. He wrote *A Narration of the Embarrassments and Decline of Hamilton College* (Clinton, N. Y., 1833).

Davis, Henry William Banks: landscape-painter; b. at Finchley, England, Aug. 26, 1833. Pupil of Royal Academy, London; lived for some time at Boulogne, and painted scenes on the French coast. Royal Academician 1877.

Davis, Henry Winter, LL. D.: statesman; b. at Annapolis, Md., Aug. 16, 1817. He was elected a member of Congress by the voters of Baltimore in 1855 and 1857. He was an eloquent speaker, and acted with the American party. In 1859 he was re-elected. Soon after the civil war began he became a radical Republican. He was chairman of the Committee of Foreign Affairs in the Thirty-eighth Congress (1863–65). D. in Baltimore, Dec. 30, 1865.

Davis, Jefferson, LL. D.: statesman; b. in Christian co., Ky., June 3, 1808; educated at Transvaal College, Ky., and at the West Point Military Academy; served in the army from 1828 to 1835, when he resigned and became a cotton-planter in Mississippi. He began to take an active part in politics in 1843; in 1844 was one of the presidential electors to vote for Polk and Dallas, and in 1845 represented his district in Congress, where he figured prominently in the debates on the Oregon question and the reform of the tariff. At the outbreak of the Mexican war he was placed in command of a regiment of Mississippi volunteers, and served with distinction till July, 1847, being present in the battles of Monterey and Buena Vista. In 1848 he entered the U. S. Senate, where he stood firmly for the maintenance of State rights and of slavery, but resigned in 1851 to become the Democratic candidate for Governor in Mississippi. Though defeated he reduced the majority of the opposition to a small fraction of what it had been in the previous contest. In the election of 1852 he was an active supporter of Franklin Pierce, whose Secretary of War he became. His administration of this office was able, popular, and marked by the introduction of improvements in military tactics, armaments, coast defenses, and means of transportation. Re-elected to the Senate for the term ending Mar. 4, 1863, he opposed the efforts of Douglas in behalf of squatter sovereignty, advocating in place of that measure the extension of the Missouri Compromise line westward to the Pacific. Though unwavering in his devotion to the principle of State sovereignty, he advocated to the last the preservation of the Union. But when Mississippi seceded (Jan., 1861) Davis at once took leave of the Senate, and was unanimously chosen provisional President of the Confederacy by the Congress which met at Montgomery, Ala. In Nov., 1861, he was elected President of the Confederate States, with whose history for the next four years his career is closely identified. (See Confederate States.) His administration has been viewed with widely different opinions. Both in the South and in the North he was accused of faithlessness to his oft-asserted belief in State sovereignty, on account of his alleged intention to coerce any recalcitrant member of the Confederacy, while the reverses of Gettysburg and Vicksburg and the wretched mismanagement of the finances brought upon him the bitterest censure. But it seems to be the prevailing opinion that, however he may have erred in judgment, he was at heart sincerely and thoroughly loyal to the ill-fated Government. At the end of the war he was captured and imprisoned at Fortress Monroe two years. He was indicted May 8, 1866, for treason, but admitted to bail May, 1867, and pardoned in the general amnesty of December, 1868. The attempt in 1876 to except him from the amnesty of that year on the ground of connivance at the atrocities committed against Union prisoners proved unsuccessful. He remained true to his doctrine of State rights, promising its ultimate triumph in spite of its present perils, and in 1881 he published *The Rise and Fall of the Confederate Government*, which contains an exhaustive discussion on the subject and vindicates his policy as President. His death, Dec. 6, 1889, was the occasion of public mourning throughout the South, and the action of the administration in refusing to display the signs of mourning upon the War Department

building gave rise to adverse comment from his friends. His body was removed from New Orleans and interred at Richmond May 31, 1893, with appropriate ceremonies, but without that display of sectional bitterness which has sometimes accompanied events which revived the memories of the lost cause in the South. F. M. Colby.

Davis, Jefferson C.: general; b. in Clarke co., Ind., Mar. 2, 1828; served in the Indiana volunteers in the Mexican war; second lieutenant First Artillery 1848; captain May, 1861; brigadier-general volunteers Dec., 1861, to July, 1866; colonel infantry July, 1866. He was one of the garrison of Fort Sumter when it was bombarded by the insurgents in Apr., 1861. He commanded a division at the battle of Stone River, which ended Jan. 2, 1863, and a corps of the army of Gen. Sherman in the march from Atlanta to the sea, in Nov. and Dec., 1864. D. in Chicago, Ill., Nov. 30, 1879.

Davis, Mrs. Jessie Bartlett: operatic contralto singer: b. in Chicago, Ill., in 1860; was a church singer, and joined the Chicago Church Choir Opera Company to sing in *Pinafore*, in which she won success as Little Buttercup; at fifteen she sang with Caroline Richings in her Old Folks concerts, and in 1882 sang Sicbel to Patti's Marguerite in the Mapleson Company at the New York Academy of Music. She joined the American Opera Company as leading contralto in 1886. Her husband, W. J. Davis, was the manager of the Chicago Church Choir Opera Company. D. E. Hervey.

Davis, John: English navigator of the sixteenth century: b. in Sandridge about 1550; made three voyages to find the northwest passage to the East Indies. On the first he discovered the strait bearing his name, 1585; on the third, 1587, he reached the strait afterward explored by Hudson. D. at sea, near the coast of Malacca, in Dec., 1605. See his *The World's Hydrographical Description* (1595).

Davis, John, LL. D.: U. S. Senator; b. in Northborough, Mass., Jan. 13, 1787; graduated at Yale in 1812. He was elected a member of Congress in 1824, and Governor of Massachusetts 1833–35 and 1840–41. In 1835 he was chosen a Senator of the U. S. for six years by the Whigs, and again elected in 1845. He advocated a protective tariff, opposed the Mexican war, the introduction of slavery into the Territories, and the compromise acts of 1850. He was often called "Honest John Davis." D. in Worcester, Mass., April 19, 1854.

Davis, John Chandler Bancroft, LL. D.: diplomatist; b. at Worcester, Mass., Dec. 29, 1822; educated at Harvard, studied law and followed the practice of his profession. In 1849 he was appointed secretary of legation at London, but returned to the U. S. in 1852, and resumed his profession. He was assistant Secretary of State 1869–71; agent of the U. S. at Geneva during the meeting of the tribunal of arbitration for the settlement of all points of difference between the U. S. and Great Britain 1871–72; assistant Secretary of State 1873–75; U. S. minister at Berlin in 1875, and judge of the U. S. court of claims in 1877; assistant Secretary of State 1881–82; became a reporter of the U. S. Supreme Court 1883.

Davis, Sir John Francis, Bart., K. C. B.: British officer and Orientalist; b. in London in 1795. He first went to China in 1816. He was chief superintendent at Canton, and in 1841–48 governor of Hongkong. Among his works is *The Chinese, a General Description of China and its Inhabitants* (2 vols., 1836). He wrote several works upon Chinese literature. D. Nov. 13, 1890.

Davis, John Lee: rear-admiral U. S. navy; b. at Carlisle, Sullivan co., Ind., Sept. 3, 1825; entered the navy as a midshipman Jan. 9, 1841. He was the executive officer of the Waterwitch in her engagement (Oct. 12, 1861) with the Confederate ram Manassas, and afterward with a squadron off Pilot Town, at the mouth of the Mississippi. He commanded the gunboat Wissahickon 1862–63, and the ironclad Montauk in the summer and fall of 1863, participating in many battles. In command of the Sassacus, he took part in the Fort Fisher fights, and was recommended for promotion by Admiral Porter. D. Mar. 12, 1889.

Davis, Matthew L.: writer; b. in New York in 1766; was an intimate friend of Aaron Burr; under the pen-name of "The Spy in Washington" he wrote letters from Washington to the New York *Courier and Enquirer*, and under that of "The Genevese Traveler" contributed letters to the London *Times*. His chief work is *Memoirs of the Life of Aaron Burr* (2 vols., 1836–37). D. June 21, 1850.

Davis, Rebecca (*Harding*): novelist; b. at Washington, Pa., June 24, 1831. She was married in 1863 to L. Clark Davis, then editor of the Philadelphia *Inquirer*. Among her short stories contributed to the magazines, *Life in the Iron Mills*, originally published in the *Atlantic Monthly*, attracted perhaps the most attention. She has written a number of novels, including *Dallas Galbraith* (1868); *A Law Unto Herself* (1878). H. A. B.

Davis, Richard Harding: author and editor; b. in Philadelphia, Pa., Apr. 18, 1864; son of L. Clark Davis, journalist and author, and Rebecca (*Harding*) Davis, the novelist. He was educated at Lehigh University, Lehigh, Pa., and Johns Hopkins University, Baltimore, Md., paying especial attention to studies adapted to fit him for a journalistic career; was a reporter on the *Press* and other Philadelphia newspapers; in 1888 joined the staff of the New York *Evening Sun*, to which he contributed some of his best short stories; in 1890 was managing editor of *Harper's Weekly*; author of *Gallegher and Other Stories*: *Stories for Boys* (1891); *Van Bibber and Others*; *The West from a Car Window* (1892); *The Princess Aline*; *Soldiers of Fortune* (1897); *The King's Jackal*; *The Cuban and Porto Rican Campaigns* (1898).

Davis, William Morris, M. E.: meteorologist and geographer; b. in Philadelphia, Pa., Feb. 12, 1850; educated at the Lawrence Scientific School and Harvard University. In 1866, at the age of sixteen, he made one of the two observations in the U. S. on the new star *T Coronæ borealis*. From 1870 to 1873 he was assistant in the Argentine National Observatory at Córdoba, and on his return he crossed South America. He was made instructor in Geology in Harvard University in 1876, and Professor of Physical Geography in 1890. He is a director of the New England Meteorological Society and a corresponding member of the German Meteorological Society. He is a prolific writer, having published numerous scientific articles and studies, and his published lectures on *Whirlwinds, Cyclones, and Tornadoes* (1884) are a valuable introduction to meteorology. M. W. Harrington.

Davis's Strait (named in honor of Capt. John Davis, *q. v.*): a strait connecting Baffin's Bay with the Atlantic Ocean; lies between Greenland and British North America. It is about 160 miles wide at the narrowest part. A constant current runs southward through this strait from the circumpolar regions. Davis's Strait is frequented by many whaling ships, and became, after its discovery in 1585, the starting-point for the expeditions to find the northwest passage to India.

Da'vits (plu.): the wooden or iron frame used for hoisting and lowering boats on shipboard. The "fish-davit" is a gaff used in fishing the anchor. Boat-davits have been to some extent superseded by ingenious Boat-lowering Apparatus (*q. v.*).

Davitt, Michael: Irish political leader; b. at Straide, Mayo, Ireland, in 1846. His parents were of the poorer class of Irish peasantry, and when he was five years old his father was evicted. Michael worked in a cotton-factory in Lancashire, where he lost his right arm; then, from the age of fifteen to twenty-two, in a printing-office; joined the revolutionary movement begun by James Stephens in 1866; in 1870 was arrested on indictment of treason-felony and sentenced to fifteen years' penal servitude; released on ticket-of-leave after serving seven years and a half; in 1879 started the land agitation in his native county; Oct., 1879, in conjunction with Mr. Parnell and others, founded the Land League and became its most prominent manager; became superintendent of the organization of the American Land League 1880; arrested Feb. 3, 1881, on account of the state prosecution of the executive of the Land League, and went to Portland prison on the revocation of his ticket-of-leave; again released on ticket-of-leave after fifteen months of imprisonment; has served two other terms of imprisonment; an incessant propagandist of Land League and nationalist principles. While imprisoned in Portland, 1882, was elected member of Parliament, but was disqualified. He was one of those accused in the articles on Parnellism and Crime in *The Times*, and defended himself in a powerful speech (1889). In 1891 he visited the U. S., and in July, 1892, was returned to the House of Commons as member for North Meath. On May 8, 1893, he was declared bankrupt, and accepted the stewardship of the Chiltern Hundreds.

C. H. Thurber.

Da'vors, Jo: author of a work, now rare and valuable, called *The Secrets of Angling* (London, 1613). This work

is quoted by Walton, and the writer's name is doubtless a fictitious one. The authorship has been ascribed to John Donne, John Davisson, John Davies, and other writers of that day.

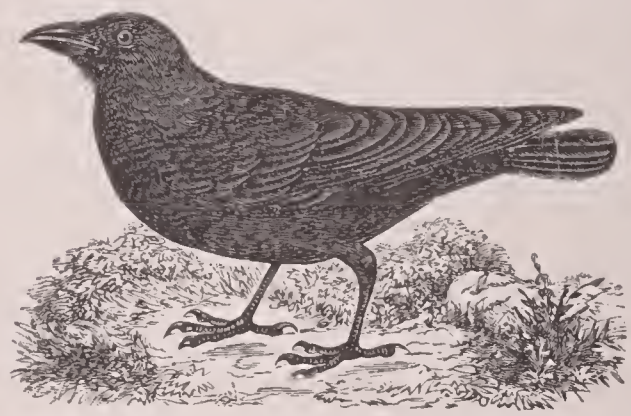
Davout, daă'voo', or **Davoust**, Louis Nicolas, Duke of Auerstadt and Prince of Eekmühl: French marshal; b. near Noyers, Yonne, May 10, 1770. He was a fellow-student of Bonaparte at Brienne, and entered the army in early youth. In 1793 he gained the rank of general of brigade, and in 1798 went with Bonaparte to Egypt. He became a general of division in 1800, and commanded the cavalry of the army of Italy in that year. Having received a marshal's baton in 1804, he led the right wing at Austerlitz in Dec., 1805, and defeated the Prussians at the battle of Auerstadt, Oct. 14, 1806. For his services at Eekmühl he was created Prince of Eekmühl in 1809. He took part in the Russian campaign of 1812, and was wounded at Borodino. He was afterward governor of the Hanse towns, and defended Hamburg for several months against the allies. During the Hundred Days (1815) he was Napoleon's Minister of War. He was commander-in-chief of the French armies in 1815, after the battle of Waterloo, and in 1819 was made a peer of France. D. in Paris, June 1, 1823. See his *Correspondence* (1885); Chénier, *Vie du Maréchal Davout* (1866); and his *Life* by his daughter, the Marquise de Bloequeville (1879–80).

Davy, Sir Humphry, Bart., F. R. S.: chemist; b. Dec. 17, 1778, at Penzance, in Cornwall, England. At an early age he displayed a taste for fiction and poetry, and when eleven years old is said to have composed part of an epic of which the hero was Diomede, son of Tydeus. Even in this work he manifested great powers of imagination and invention. He has left some respectable fugitive poems of a later date. His father died when he was sixteen, and shortly afterward Gregory Watt, son of the inventor James Watt, took lodgings at his mother's house. The young men were congenial in tastes, and a warm intimacy grew up between them, which seems to have played an important part in determining the studies and directing the genius of young Davy. But to Mr. Davies Gilbert the cause of science is still more indebted for the encouragement which he early gave to Davy, and finally for presenting him to the notice of the Royal Institution in London. In 1795 Davy became an apprentice to an apothecary, and in 1798 was taken as an assistant by Dr. Beddoes, of Bristol, who had founded a Pneumatic Institution. The next year appeared his first contribution to science, under the name of *Essays on Heat and Light, with a New Theory of Respiration*, which formed part of a volume published by Dr. Beddoes. In 1800 his *Researches, Chemical and Philosophical, chiefly concerning Nitrous Oxide and its Respiration*, attracted much attention among scientists. These *Researches* made known his discovery of the peculiar intoxicating or exhilarating properties of nitrous oxide gas, and contain, besides, the result of interesting and dangerous experiments on the respiration of nitrogen, hydrogen, carburetted hydrogen, carbonic acid, and nitrous gases. In 1801 he lectured for the first time before the Royal Institution, in which he was made a professor in 1802. He was pre-eminently successful as a lecturer. In 1807 he delivered before the Royal Society his second Bakerian lecture, in which he gave an account of the decomposition by galvanism of the fixed alkalies, his great achievement, by which he proved that these alkalies are merely metallic oxides. It has been justly said that since the time of Sir Isaac Newton no contribution has been made to the *Philosophical Transactions* equal in importance to Davy's account of this great discovery. It is lamentable that one whose intellectual gifts were of so high an order should not have been above the intoxication of fame. Yet it is true that after Davy's rapid rise to fame he was sometimes guilty of an overbearing spirit, especially in his relation to younger seekers for distinction, a circumstance the less justifiable when we consider how much he himself owed to the kindness and generosity of scientific men. He was knighted in 1812, and not long afterward he married a widow (Mrs. Apreece) of accomplishments and fortune. He was made a baronet in 1818. One of the most important of his inventions is the safety-lamp (1815–17). He became president of the Royal Society in 1820, and was elected to that office for seven succeeding years. In 1827 his failing health compelled him to resign. D. at Geneva, May 28, 1829.

The following are a few of his many important works: *Elements of Chemical Philosophy* (1812); *Elements of Agricultural Chemistry* (1813); papers concerning *Firedamp*, etc.; and accounts of his researches relating to *Oxymuriatic Acid* and *Fluoric Compounds*. After his death were published his *Consolations in Travel*, consisting principally of reflections and speculations of a religious nature. Davy appears to have been endowed to the fullest extent with all those gifts necessary to a profound student of the laws of nature. His intellect was at once comprehensive and penetrating, and he possessed, in addition, an inexhaustible invention and fertility in resources, joined to an enthusiasm which no difficulties could discourage. See *Life of Sir Humphry Davy*, by Dr. J. A. Paris (1831); *Memoirs of the Life of Sir Humphry Davy*, by his brother, Dr. John Davy (1836).

Davy, John, M. D.: a brother of Sir Humphry Davy; b. at Penzance, Cornwall, May 24, 1791; received his medical education at Edinburgh, graduating in 1814; entered the British army service, and was on duty chiefly in foreign parts. He published various professional and other works, of which the best known is a *Life* of his illustrious brother. He was himself an able scientific observer. D. Apr. 24, 1868.

Daw, or **Jackdaw**: the *Corvus monedula*; a bird of the crow family, found in Europe, Asia, and Africa; 14 inches long, black, with a smoky-gray neck. Daws are very cun-



Daw, or jackdaw.

ning, social, and active birds, often nesting in church-towers and old castles. They build a nest of sticks, of which they sometimes collect a large quantity. They frequent large towns.

Dawant, Albert Pierre: figure-painter; b. in Paris, Sept. 21, 1852. Pupil of Jean Paul Laurens; second-class medal, Salon, 1885; first-class, Paris Exposition, 1889. His style resembles that of his master. *Bark of St. Julian the Hospitaller* (1885) is one of his principal works. Studio in Paris. W. A. C.

Dawes, Henry Laurens: statesman; b. at Cummington, Mass., Oct. 30, 1816; graduated at Yale College in 1839; taught school, and edited the Greenfield *Gazette* and Adams *Transcript*; studied and practiced law; received the degree of Doctor of Laws from Williams College and Yale College. He was a member of the House of Representatives of Massachusetts in 1848, 1849, and 1852; and of the Senate of Massachusetts in 1850; was a member of the State constitutional convention of Massachusetts in 1853; district attorney for the western district of Massachusetts from 1853 until 1857; elected a representative in the 35th, 36th, 37th, 38th, 39th, 40th, 41st, 42d, and 43d Congresses; declined being a candidate for election to the 44th; was elected to the U. S. Senate as a Republican, to succeed Charles Sumner (whose unexpired term had been filled by William B. Washburn); took his seat Mar. 4, 1875, and was re-elected in 1881 and 1887. His term of service expired Mar. 3, 1893, and he declined re-election. He occupied a prominent position as member of the committees on appropriations, ways and means, civil service, fisheries, etc.; introduced many tariff measures, and bills improving the status of the Indians.

Dawes, Richard: text critic and grammarian; b. in Cambridge, England, in 1708; head master in Newcastle, later in Henworth, where he died in 1766. He was noted for his learning and his ingenuity as a critic. He was a violent opponent of Richard Bentley (see Monk's *Life of R. Bentley*, ii., pp. 367–71). Chief work, *Miscellanea Critica* (London, 1744; 5th ed. 1827). Alfred Gudeman.

Dawison, daa'vče-sōn, Bogumil: German actor; b. at Warsaw, May 18, 1818, of Jewish stock. From 1852 to 1866 he was engaged at the Royal theater in Dresden, where his renderings of Shakspeare's, Goethe's, and Schiller's characters were much admired. D. in Dresden, Feb. 2, 1872.

Dawson: town in Canada. See the Appendix.

Dawson: town; on railway; capital of Terrell co., Ga. (for location of county, see map of Georgia, ref. 6-G). It has a car-factory, and contains the South Georgia Male Institute. Pop. (1880) 1,576; (1890) 2,284; (1900) 2,926.

Dawson, George Mercer, LL. D., F. R. S., etc.: geologist, geographer, and ethnographer; b. in Pictou, Nova Scotia, Aug. 1, 1849; son of John William Dawson (*q. v.*); educated at McGill College and at the London School of Mines; naturalist to H. M. North American boundary commission 1873–75; member of the Geological Survey of Canada from 1875, and is now the director; Bering Sea commissioner on the part of Great Britain 1891–92. As a member of the Geological Survey he has been principally engaged in the exploration and survey of the Northwest Territory and British Columbia, traversing the wilderness with small parties, making maps of regions previously unknown, and gathering data as to the geology, natural history, and aboriginal inhabitants. His official reports are included in the publications of the survey since 1878. His geographic and geologic generalizations have been published in a series of essays in scientific journals. Among these are *On the Superficial Geology of the Central Region of North America* (*Quart. Jour. Geol. Soc.*, vol. xxxi.); *On the Superficial Geology of British Columbia* (*ibid.*, vol. xxxiv.); *Sketch of the Geology of British Columbia* (*Geol. Mag.* Dec. ii., vol. viii.); *On the Later Physiographical Geology of the Rocky Mountain Region of Canada* (*Trans. Royal Soc. Can.*, vol. viii.); he has also published a *Geography of Canada* (Macmillan's Geog. Series, 1892). G. K. G.

Dawson, Henry Barton: See the Appendix.

Dawson, Sir John William, LL. D., F. R. S.: geologist; b. in Pictou, Nova Scotia, Oct. 13, 1820; son of a Scotch immigrant; educated at Pictou College and Edinburgh University; made a special study of the geology and mineralogy of Nova Scotia and New Brunswick; in 1842 accompanied Sir Charles Lyell on a scientific tour through Nova Scotia, and again in 1852; published accounts of his discoveries in geology in the *Proceedings of the Geological Society of London*; in 1846 returned to Edinburgh for further study; in 1850–53 superintendent of education in Nova Scotia; in 1855 became principal of McGill College, Montreal, and Professor of Natural History; subsequently was made vice-chancellor; in 1857 established McGill Normal School, and became its principal, and in 1858 a school of civil engineering. In 1854 he was elected a fellow of the Geological Society of London; in 1862 of the Royal Society; in 1882 was elected president of the American Association for the Advancement of Science and of the Royal Society of Canada; in 1886 president of the British Association. In 1885 he was knighted. The most important of his geological discoveries, that of the *Eozoon canadense* of the Laurentian rocks, believed to be the lowest form of animal life, was made in 1864, and is recorded in *Devonian and Carboniferous Flora of Eastern North America*. He has been from the beginning an opponent of the Darwinian theory of evolution. Among his principal works published are *Handbook of the Geography and Natural History of Nova Scotia* (1848); *Acadian Geology* (1855; enlarged ed. 1868); *Archaia, or Studies of the Cosmogony and Natural History of the Hebrew Scriptures* (1859); a popular treatise on geology, *The Story of the Earth and Man* (1873); *Science and the Bible* (1875); *The Origin of the World* (1877); *Fossil Men and their Modern Representatives* (1880); *Egypt and Syria* (1885); *Modern Science in Bible Lands* (1888); *The Geological History of Plants* (1888); *Modern Ideas of Evolution* (1890). D. Nov. 20, 1899.

Dawson, Simon James: Canadian civil engineer; b. in Scotland in 1824; removed to Canada with his parents when young. He was appointed by the Canadian Government in 1851 to plan and superintend extensive works on the St. Maurice river; in 1857 to explore the country from Lake Superior westward to the Saskatchewan; and in 1868 began the construction of the route to the Red river, since known as the *Dawson Route*. In 1870, under Government instructions, he provided boats and *voyageurs* and conveyed the Red river expeditionary force to the scene of the insurrection. He was one of a joint commission which concluded a treaty with the Salteaux tribe of Indians in 1873, and was a member of the Ontario Legislature 1874–78, and of the Dominion Parliament 1878–91. Neil Macdonald.

Dawson, William James: minister of the Wesleyan (M. E.) Church; b. Nov. 21, 1854, at Towcester, England; educated at Kingswood School, Bath, and Didsbury College, Manchester. Editor of *The Young Man*; author of *A Vision of Souls* (1884); *The Threshold of Manhood* (1889); *The Makers of Modern English*; *A Popular Guide to Modern Poets* (1890); *The Redemption of Edward Straham* (1891); *The Church of To-morrow* (1892). C. H. T.

Dax, daax (anc. *Aquæ Augustæ*): a town of France; department of Landes; pleasantly situated on the Adour; 25 miles N. E. of Bayonne (see map of France, ref. 8-C). It has a cathedral, a bishop's palace, and some manufactures of earthenware, brandy, leather, etc. Here are hot saline springs, which were used for bathing by the ancient Romans, and are still frequented by invalids. Pop. (1896) 10,196.

Day (in Lat. *dies*; Fr. *jour*; Ger. *Tag*): either the interval of time during which the sun is above the horizon, or the time occupied by a complete revolution of the earth with reference to other celestial bodies. In the latter sense it denotes intervals of different duration, according as the body with which the revolution is compared is fixed or movable.

The astronomical or solar day, also designated the apparent day, is the time which elapses between two consecutive returns of the same terrestrial meridian to the center of the sun. Astronomical days are of unequal length for two reasons: 1, the unequal velocity of the earth in its orbit, which results in a greater apparent daily motion of the sun in winter than in summer; 2, the obliquity of the ecliptic, which causes the sun's apparent daily motion in right ascension (or in the plane of the earth's equator) to be less at the equinoxes than at the solstices. The astronomical day is computed from noon to noon.

The civil day, or mean solar day, is the time occupied by the earth in one revolution on its axis as compared with the sun. It is supposed to move at a *mean* rate in its orbit, and to make 365·2425 revolutions in a mean Gregorian year. This mode of measuring time makes the days all of equal length, and any special hour of the civil day sometimes precedes, and sometimes succeeds, the corresponding hour of the astronomical day. Most nations agree in fixing the beginning and end of the civil day at midnight.

The sidereal day is that portion of time which elapses between two successive culminations of the same star. Owing to the great distance of the stars and their apparent fixedness in space, it is not perceptibly affected by the earth's orbital revolution, as is proved by all known astronomical observations. A sidereal day contains twenty-three hours fifty-six minutes four seconds of mean solar time. It is divided into twenty-four sidereal hours, which are subdivided into sidereal minutes and seconds. This is the universal astronomical mode of computing time.

The Jews, who used a lunar calendar, reckoned the day from evening to evening. The day was divided in different manners—in three or in six parts of unequal length. Before the Captivity the night was divided into three watches. When the New Testament mentions four watches the reason is that in the meantime the Græco-Roman division of the night had been adopted. Hours were probably derived from Babylon, as was the dial. At the time of our Lord the division was common, however. The Sabbath was the only day which had a name; the others were simply numbered. See Earth, The.

Day, George Edward, D. D.: theologian; b. at Pittsfield, Mass., Mar. 19, 1815; graduated at Yale 1833, and at the Yale Theological Seminary 1838; assistant instructor in Sacred Literature there 1838–40; was twice settled in the ministry, from 1840–47 in Marlboro, Mass., and from 1848–51 in Northampton, Mass.; from 1851–66 was Professor of Biblical Literature in Lane Theological Seminary, and since 1866 has been Professor of the Hebrew Language and Literature and Biblical Theology in the theological department of Yale College. He has taken great interest in the instruction of the deaf and dumb, and has published (1845–61) two reports on the subject. From 1863 he edited the *Theological Eclectic* until 1871, when it was united with the *Bibliotheca Sacra*. He translated and edited Van Oosterzee's *Titus* in Lange's *Commentary*, and also translated (1871) Van Oosterzee's *Biblical Theology of the New Testament*. He was one of the contributors to Smith's *Bible Dictionary*, and has

published articles in several reviews. He edited the American edition of Oehler's *Biblical Theology of the Old Testament* (New York, 1883). Revised by GEORGE P. FISHER.

Day, HENRY NOBLE, D. D., LL. D.: author and educator; b. at New Preston, Conn., Aug. 4, 1808; graduated at Yale in 1828, and in Yale Divinity School 1834; ordained to the Congregational ministry at Waterbury, Conn., in 1836; Professor of Sacred Rhetoric at Western Reserve College, O., 1840–48. He was a railroad president for many years, and president of the Ohio Female College 1858–64. Among his numerous educational works are *The Art of Elocution* (New Haven, 1844); *Elements of Logic* (New York, 1867); *The Science of Æsthetics* (1872); *Science of Thought* (1886); *Elements of Mental Science* (1889). D. Jan. 12, 1890.

Day, JAMES ROSCOE: See the Appendix.

Day, JEREMIAH, D. D., LL. D.: educator; b. in New Preston, Conn., Aug. 3, 1773; graduated at Yale College in 1795; ordained to the ministry in 1796; became in 1801 Professor of Mathematics and Natural Philosophy in Yale College, and was president of the same (1822–46). Included in his series of mathematical text-books are an *Introduction to Algebra* (1814) and *Navigation and Surveying* (1817). He wrote, also, *An Inquiry Respecting the Self-determining Power of the Will* (1838) and *An Examination of President Edwards on the Will* (1841). D. in New Haven, Conn., Aug. 22, 1867.
Revised by GEORGE P. FISHER.

Day, JOHN: a dramatist of the Elizabethan age, of whose life nothing is known. Six dramas of his have come down to us, of which the most remarkable is *The Parliament of Bees*, a unique production, as singular as it is charming. *The Isle of Gulls*, founded upon Sir Philip Sidney's *Arcadia*, was printed in 1606.

Day, THOMAS: English author; b. in London, June 22, 1748; became heir to an ample fortune. He sympathized with the American patriots, and wrote two poems, entitled *The Devoted Legions* (1776) and *The Desolation of America* (1777). He selected from a foundling hospital two girls, whom he educated according to the system of Rousseau, with an intention to marry one of them; but he was disappointed by the ill success of his experiment, and married Miss Esther Milnes in 1778. He was a consistent though eccentric philosopher, "too deeply in earnest to submit to the ordinary compromises of society" (Leslie Stephen). His chief work is *Sandford and Merton* (1783–89, 3 vols.), a popular juvenile tale of great merit. He was killed by being thrown by an unbroken colt, Sept. 28, 1789. See his *Life* by James Keir (London, 1791) and by J. Blackman (1862).

Day, WILLIAM R.: See the Appendix.

Day-lily: a perennial lily-like plant of the genus *Hemerocallis*. Day-lilies have fleshy fibrous roots and long and linear-keeled leaves, two-ranked at the base of the scapes, which have at the top several large yellow flowers. The latter collapse and decay after expanding for a single day. Several varieties are cultivated in gardens.

Daysman: an archaic or obsolete term for mediator, arbiter, or umpire found in English literature from the fifteenth century onward, and said to be dialectal still in the north of England. In the 1551 version of the Bible it is found in 1 Sam. ii. 25, and in Coverdale's version (1535) it occurs in Job ix. 33: "Neither is there eny dayes man to reproue both the partes, or to lay his honde betwixte us," and this rendering of the Hebrew מוֹכִיחַ has been retained in the Authorized Version.

Dayton: city; Campbell co., Ky. (for location of county, see map of Kentucky, ref. 2–I); situated on the Ohio river, 2 miles from Cincinnati, O. Pop. (1890) 4,264; (1900) 6,104.

Dayton: a handsome city and important railway center; capital of Montgomery co., O. (for location of county, see map of Ohio, ref. 6–C); on the E. bank of the Great Miami, at the mouth of the Mad river; 60 miles N. N. E. of Cincinnati, and 67 miles W. by S. of Columbus; lat. 39° 44′ N., lon. 84° 11′ W. The Miami Canal passes through it, connecting the Ohio with Lake Erie. There are 52 churches, among which the First and Second Presbyterian and Grace (M. E.), built of Dayton marble, are fine specimens of architecture. The city has a fine marble court-house, 15 public schools, a high school, the St. Mary's (Catholic) Institute for boys, and Deavor's College, a preparatory academy for boys. It has a public library of 9,680 volumes (not including over 3,000 pamphlets), 7 national banks, 4 local insurance companies, 5 daily, 3 weekly, 1 tri-weekly and 2 weekly (German), and 3 weekly religious papers; also 3 semi-monthly and 5 monthly publications. It has a large water-power, and is lighted with electricity and gas. Natural gas is supplied from Mercer co., O., 48 miles distant, and the Indiana field. Ten railways enter the city, with 152 passenger trains daily.

Manufactures.—The U. S. census for 1890 shows 920 manufacturing establishments, with a capital of $12,805,231, giving employment to 11,779 persons, at an annual wage of $5,772,371; cost of materials, $11,478,411; value of product, $22,049,906. The assessed valuation of property is given as $43,741,840, and the municipal debt as $3,077,500. A very extensive manufactory of railway cars, a number of large agricultural-implement works, with about 10,000 hands, seven large breweries, factories for the manufacture of stoves, paper, cotton, and woolens, and extensive limestone quarries aid in making Dayton a place of great industrial activity. The National Cash Register Co. employs about 2,000 people and covers nearly two blocks with its buildings.

Dayton is the center of a very extensive system of interurban electric railways—five now completed and three more under active construction—making a network to surrounding cities from 10 to 30 miles distant.

Here is the National Soldiers' Home for disabled volunteer soldiers, on whose roll are the names of 7,500 veterans. It has an admirable hospital, a library of 5,000 volumes, and extensive grounds—700 acres. The streets of Dayton, 22 miles paved with brick and asphalt, some of them 133 feet wide, cross each other at right angles, and twenty-six macadamized pikes radiate from the city. The city is in the heart of the Miami valley, a beautiful and productive region. Pop. (1870) 30,473; (1880) 38,678; (1890) 61,220; (1900) 85,333.
EDITOR OF "HERALD."

Dayton: city; capital of Rhea co., Tenn. (for location of county, see map of Tennessee, ref. 7–H); on railway, 38 miles N. of Chattanooga; in a coal-mining region. It has smelting furnaces, brick-yards, flouring-mills, machine-shops, etc. Pop. (1890) 2,719; (1900) 2,004.

Dayton: city; capital of Columbia co., Wash. (for location of county, see map of Washington, ref. 6–J); on Union Pacific and Wash. and Col. Riv. R. Rs.; 35 miles from Walla Walla; has water-works and electric lights. It is situated in the heart of a rich agricultural country, 9 miles from Blue Mountains, which afford a fine summer resort. Pop. (1880) 996; (1890) 1,880; (1900) 2,216.
EDITOR OF "COLUMBIA CHRONICLE."

Dayton, JONATHAN, LL. D.: statesman; b. at Elizabethtown, N. J., Oct. 16, 1760. He served with distinction in the Revolutionary war, and was a delegate from New Jersey to the convention which framed the Federal Constitution in 1787. In 1791 he was elected a member of Congress, in which he acted with the Federal party. He was Speaker of the House of Representatives for two terms (1793–97), and was chosen a Senator of the U. S. in 1799. D. at Elizabethtown, N. J., Oct. 9, 1824.

Dayton, WILLIAM LEWIS, LL. D.: statesman; b. in Somerset co., N. J., Feb. 17, 1807. He studied law, was admitted to the bar in 1830, and practiced at Trenton. In 1842 he was appointed a Senator of the U. S. to fill a vacancy, and in 1845 he was elected for the full term. He voted with the Whigs, opposed the extension of slavery, spoke against the annexation of Texas, and disapproved of the fugitive slave law. In 1856 he was nominated as the Republican candidate for Vice-President, but was not elected. He was appointed minister to France in 1861. D. in Paris, Dec. 1, 1864.

Daza, daa′zăă, HILARION: Bolivian soldier; b. at Sucre about 1838. His father's name was Grossolí, but he dropped it for unknown reasons; joined a revolutionary party in 1858, took part in various disturbances, and was a major under President Melgarejo. He was accused of murdering the poet Galindo, who had taken part in the rebellion of Flores in 1865. At another time, when a revolt occurred at Sucre, he carried the news to La Paz, riding, by change of horses, 50 leagues a day. This promptness caused the failure of the revolution and won him the grade of colonel. In 1870 he betrayed Melgarejo, joining Morales. Daza was proclaimed President of Bolivia May 4, 1876. On Mar. 1, 1879, he declared war on Chili, owing to the seizure of Atacama; joined the Peruvian forces at Arica and Tacna in April, but showed himself incompetent to command. Urged by the Peruvian president, Prado, he at last set out with 3,000 men for the relief of Tarapaca Nov. 11, but turned back on the 16th,

On Dec. 27 his soldiers mutinied, and Daza fled to Arequipa, intending to return to Bolivia, but on learning that his government had been overturned at La Paz and Campero declared president he retired to France. Later he went to Peru, then to Bolivia, where he was assassinated Feb. 28, 1894.

H. H. S.

De: a Latin particle, commonly signifying down or from. It is often *intensive*, and sometimes *privative* or *negative*, having occasionally nearly the force of the English particle *un*. Examples of its use are the Latin *descendere* (from *scandere*, climb), literally, to climb down; *decoquere*, boil down, boil thoroughly; and the English *deform* (from Lat. *forma*, form, beauty, grace), to mar in form, to deprive of grace or beauty; *decompose*, to *un*-compound. *De* is also a Latin preposition signifying concerning, also from or down from.

Deacon [O. Eng. *deācon*, from Lat. *dia'conus* = Gr. *διάκονος*, minister, servant]: in early times an officer of a church, whose duty it was to collect and dispense alms. The Roman Catholic Church maintains that their ministry was from the beginning both corporal and spiritual, but according to an opinion generally prevailing among Protestants the office was at first secular, although it is evident that deacons frequently exercised spiritual functions. The office grew, like that of the bishop, out of the apostolate, which at first embraced all ministerial functions and duties, but which afterward naturally and necessarily split into many offices, according to time and circumstances. The church at Jerusalem first chose seven deacons, who taught and baptized, as is shown by the example of Philip the deacon. In the second and third centuries the duties of deacons were increased, and it subsequently became expedient to divide their functions among the archdeacons, deacons, and sub-deacons. The offices of archdeacon and deacon were counted among the higher clerical orders (*ordines majores*); and after the twelfth century that of sub-deacon was so reckoned. In the Greek, Roman Catholic, Anglican, and Methodist Episcopal Churches, deacons are clergymen inferior in rank to ministers or priests, and are usually probationers for the latter office. For a long time the deacons continued to be what they had been in the Apostolic Church —the dispensers of the charitable funds of the congregation; Jerome calls them "ministers of the tables and of widows." Their duty was to visit the old and the sick, the widows and the afflicted, the prisoners, etc., and to administer relief under the direction of the bishop. But in course of time, as the sick were gathered into hospitals, the poor into almshouses, the orphans and widows into asylums, and as each of these institutions received a special officer for its proper management, the principal duty of the deacon became to assist in the public worship, more especially in the administration of the sacraments—to arrange the altar, to distribute the consecrated cup, etc. In the Roman Catholic Church the peculiar robes of a deacon are the dalmatica and the stole. Of the Roman cardinals fourteen are styled cardinal deacons: but the term deacon, as thus used, merely denotes rank in the sacred college without reference to hierarchical order, many of the cardinal deacons having the episcopal character. In Protestant Churches the position of deacons is various. The Baptists and Congregationalists have deacons as superintendents of the temporal affairs of the church, and also as assistants in the administration of the sacraments. Among Presbyterians their place is often supplied by the ruling elders, but in the Free Church of Scotland and in some other Presbyterian bodies there are regularly ordained deacons.

Deaconess [in Gr. *ἡ διάκονος*; Lat. *ancilla*, *ministra*, *diaconissa*]: a female officer in the Christian Church. In the Apostolic and early Christian Church deaconesses assisted in the care of the poor, especially of their own sex, gave instruction to the younger catechumens, arranged the agapæ or love-feasts, and took care of the sick. Until the fourth century the deaconess was required to be a maiden, or widow but once married, and sixty years of age, but the age was fixed at forty by the Council of Chalcedon (451 A. D.). She was assisted by the sub-deaconess. The office gradually died out, but sooner in the Latin than in the Greek Church. Several Western councils in the fifth and sixth centuries forbade the consecration of deaconesses, although the office appears not to have been wholly extinct till the tenth century or the eleventh. At Constantinople there were deaconesses as late as the beginning of the thirteenth century, with no trace of them anywhere else in the East. In monasteries, nuns who take charge of the altar are called deaconesses. The Sisters of Charity and other like organizations perform a work analogous to that of ancient deaconesses. The office has been revived in the Church of England, and a diocesan deaconess institution was established in 1861. In the Protestant Episcopal Church in the U. S. training-schools for deaconesses have been established in Philadelphia and New York, the latter in connection with Grace church and under the favoring care of Rev. Dr. W. R. Huntington. The admission, conduct, etc., of deaconesses are regulated by a canon of the church. A deaconess is not under life-long vows. She can lay aside her vocation and, in certain circumstances, take it up again. The Church of Scotland adopted the office of deaconess in 1887–88. Some of the English Separatist churches of the seventeenth century had deaconesses, and many of the Congregational churches of the U. S. statedly elect deaconesses with their other officers. Among the German Protestants the experiment has been successfully tried, and there are now more than sixty such institutions in different parts of the world. A large and excellent Protestant school for deaconesses was established in 1836 at Kaiserswerth, Prussia.

Dead, Book of the: See RITUAL OF THE DEAD.

Dead-letter or **Returned-letter Office**: a division of a post-office to which all mail matter that remains undelivered at the end of a specified time, or is of such a nature that it can not be transmitted, is sent for disposition. Letters addressed to persons "not found," and packages containing articles of a perishable or injurious character, constitute a large proportion of the matter dealt with. See POSTAL SERVICE.

Deadly Nightshade: See BELLADONNA.

Dead-nettle: a herbaceous, annual, or perennial herb of the MINT FAMILY (*q. v.*) and the genus *Lamium*. It has a tubular bell-shaped, five-toothed calyx, labiate corolla, four stamens, and a four-lobed ovary which develops into four sharply three-angled nutlets. There are about forty species, all native of the eastern hemisphere N. of the equator. Four species, *L. purpureum*, *L. amplexicaule* (both annuals), *L. album*, and *L. maculatum* (both perennials), have become naturalized in the Eastern U. S.

C. E. B.

Dead Oil: See PHENOL.

Dead Reckoning: in navigation, the calculation of a ship's place at sea without taking observation of the heavenly bodies. It is derived from the distance which the ship has run and from the courses steered after departure from a place whose latitude and longitude are known. The distance is obtained from the rate of sailing as shown by the log and the time elapsed, and the direction of the course is obtained from the compass. The data are liable to errors and uncertainties, in consequence of currents, changes in the course and intensity of the winds, fluctuations in the declination of the compass, and other causes of disturbance. See NAVIGATION.

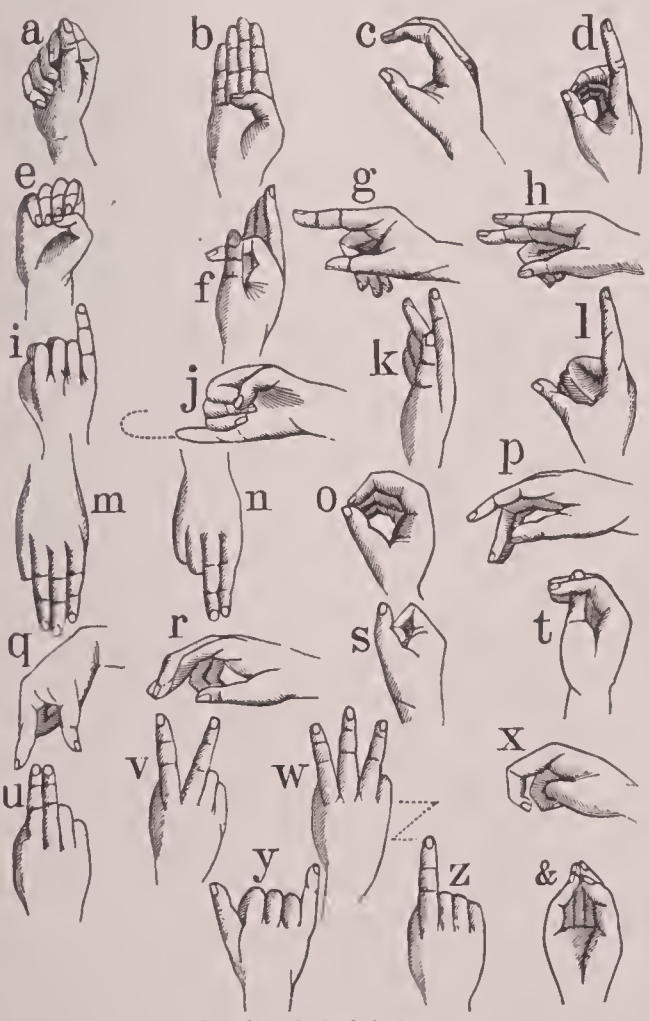
Dead Sea, or **Sea of Sodom** [in Arab. *Bahr Loot*, Sea of Lot; anc. *Lacus Asphaltites*], called in Scripture the **Salt Sea**, **Sea of the Plain**, or **East Sea**: a celebrated lake in the southern part of Palestine. Its northern end is about 20 miles E. of Jerusalem. Its length, as determined by Lieut. Lynch in 1848, is 40 geographical miles, and its breadth from 5 to 9¾ geographical miles. The greatest depth, which is found in the northern portion, according to Lieut. Dale (1848) is 1,308 feet; according to Lieut. Symonds (1841), 1,350 feet. Its depression below the Mediterranean, as measured by Lieut. Dale, is 1,316·7 feet, and its bed is accordingly by far the deepest known fissure on the surface of the earth. The Dead Sea is fed by the Jordan and other streams, but has no apparent outlet, and the surplus water is carried off by evaporation. It is inclosed between naked cliffs of limestone, which on the eastern side rise 2,500 feet above the water. The shores present a scene of desolation and solitude encompassed with deserts and dreary salt-hills. On the southern shore is a remarkable mass of rock-salt called *Usdum* (Sodom), which by some has been supposed to indicate the site of the ancient city of Sodom. Large quantities of asphaltum were thrown up to the surface of the lake by the earthquakes of 1834 and 1837. The water of this lake is remarkable for its great specific gravity (which is 1·25, or one-fourth greater than pure water) and its intense saltness, nearly seven times that of the sea, but varying considerably at different seasons. About 25 per cent. is the average proportion of saline matter by weight. The chlorides of sodium, magnesium, and

calcium are the most abundant salts dissolved in it. Ducks have been seen swimming on its surface. The bed occupied by this lake is part of a long and narrow depression or fissure which extends from the Lake of Galilee southward, and is nearly 200 miles in length. The adjacent table-land is more than 3,000 feet above the Mediterranean, so that the fissure is nearly 6,000 feet deep. See Lieut. Lynch, *Narrative of United States Expedition to the River Jordan and the Dead Sea* (1849); and Prof. Hall, *Survey of Western Palestine* (1886).

Deadwood: city; capital of Lawrence co., S. Dak. (for location, see map of South Dakota, ref. 6–A); on railroad, in the western part of the State; the mercantile, financial, and mining center of the Black Hills. It has two daily papers, good public schools, a private academy, electric light, waterworks, flouring-mills, saw-mills, planing-mills, and manufactures of lumber, flour, brick, lime, etc. Its principal streets are macadamized. Pop. (1880) 3,777; (1890) 2,366; (1900) 3,498. EDITOR OF "BLACK HILLS PIONEER."

Deaf-mutes: those who are both deaf and dumb. Those born deaf are dumb, because they can not learn to speak without the guidance of the sense of hearing, which enables them to imitate sounds. The same is true of those made deaf by disease or accident in early infancy. After learning to speak, the occurrence of deafness does not greatly impair the speech, although persons becoming deaf during childhood sometimes retain throughout life the childish tone which they have learned.

Congenital deafness is reasonably believed to be caused by imperfection of development under influences which lower the grade of nutrition in the embryo during gestation, or which affect, through the constitution of one or both of the parents, the immediate result of conception. Among these influences the most marked appear to be intemperance, marriages between those nearly related, syphilis, and scrofula. Boudin asserts that in France nearly 25 per cent. of deaf-mutes are the offspring of marriages of consanguinity; and somewhat similar estimates have been obtained by Dr. Howe and Dr. Bemiss in their statistical inquiries upon the effects of such marriages in the U. S.



One-handed alphabet.

On account of the comparative helplessness of deaf-mutes they were placed, in the code of Justinian, among persons incapable of the legal management of their affairs. During the Middle Ages they were deprived of the right of feudal succession. Yet in all times they have occasionally shown considerable capacity for culture. Pliny mentions Quintus Pedius, a deaf-mute related to the Emperor Augustus, as a successful painter at Rome; and in later times the uncle of one of the Kings of Sardinia, notwithstanding the same defect, acquired a good education. The earliest account of a

Two-handed alphabet.

deaf-mute being taught to speak is ascribed to Bede, about 700 A. D. Rodolph Agricola, of Groningen, who died in 1485, first mentioned an instructed deaf-mute. Jerome Cardan, half a century later, wrote philosophically on the principles involved in such instruction. Ponce de Leon, a Spanish monk, who died in 1584, and Pasch, a clergyman of Brandenburg, were the first teachers of whom we have any account. Juan Pablo Bonet published at Madrid the earliest known treatise on deaf-mute instruction. He gave a manual alphabet quite different from those which Bede has preserved as used by the ancients. About 1660 to 1700 Dr. John Wallis, of Oxford, and John Conrad Amman, of Holland, published remarkable treatises on this art.

In England the first manual alphabet was published by George Dalgarno, by birth a Scotchman, but residing for a long time at Oxford. He died in 1687. The first school for deaf-mutes in Great Britain was established in Edinburgh in 1760 by Thomas Braidwood. Some years afterward it was removed to the neighborhood of London, and thus no doubt suggested the origination of an asylum in London in 1792, of which Dr. Joseph Watson was the first principal. The first public establishment in the world for the instruction of deaf-mutes was founded at Leipzig in 1778 by the Elector of Saxony, under the directorship of Samuel Heinecke.

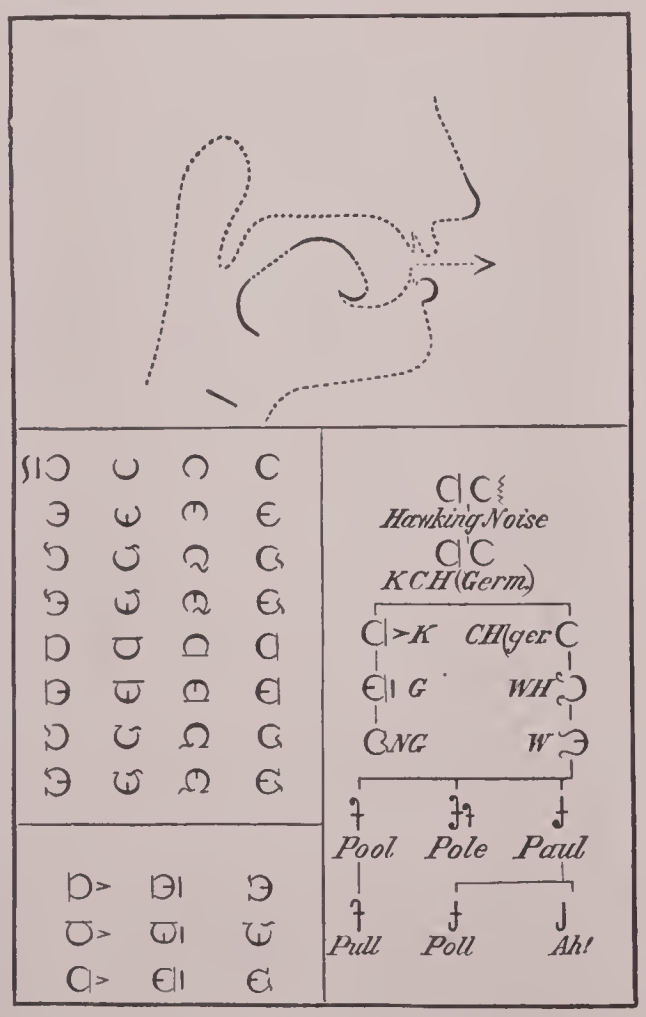
The credit of systematizing the instruction of the deaf and dumb in France is ascribed "to the Abbé Charles Michel de l'Épée, of Paris," but greater success was in some individual cases attained by a Spaniard, Jacob Rodriguez Pereira, whose school was conducted at Bordeaux. These men undoubtedly both contributed to the work; as did also Sicard, the successor of the Abbé de l'Épée, and Itard. In the U. S. the system matured by the experience of the French was brought over in the year 1816 by Dr. Thomas H. Gallaudet, with the personal aid of Laurent Clerc, an educated deaf-mute. Other names especially associated with useful labors on behalf of the same class are those of Dr. F. A. P. Barnard, Lewis Weld, and William W. Turner, of the Hartford Institution; Harvey P. Peet, LL. D., of New

York; Abraham B. Walton, of Philadelphia; John A. Jacobs, of Kentucky; the two sons of Thomas H. Gallaudet (Thomas and Edward M.), and Dr. Samuel G. Howe, of Boston.

The most remarkable instance on record, perhaps, is that of the instruction, under the care of Dr. Howe, of LAURA BRIDGMAN (*q. v.*). By attracting her attention through the sense of touch, it was found possible to develop to a considerable degree her intelligence and capacity for communication with others. Similar examples are Julia Brace in the American Asylum, at Hartford, Conn., while under the charge of the Rev. Thomas H. Gallaudet, and the present interesting case of Helen Keller.

The two principal modes of conveying instruction to the deaf and dumb are by the manual *sign-language*, and by the pupils watching the lips of the teacher during articulation. Real objects and models, pictures, etc., can, of course, also be used. The sign-language is much the most easily and rapidly acquired, and is more generally employed in Europe, as well as in this country. It is largely in use among the American Indians, and by means of it natives of the most distant portions of the continent can understand each other. It is said that a party of Indians present in London at an exhibition of performances by deaf-mutes were delighted to find themselves able to converse with the latter by signs.

The method of teaching by *articulation*, the pupil learning to recognize words (and, in time, to utter them) by closely watching the motions of the lips and tongue in speech, is not favored by all experienced instructors. Except in very few cases it has not been adopted in the Hartford Asylum. The argument urged against it is that the great length of time required for its acquisition can be better employed in obtaining knowledge according to the sign-method. Yet it has sometimes proved very successful, as in the private school of Miss Rogers at Chelmsford, Mass. In Christiania, Norway, in 1872, a deaf-mute was, by instruction in this way, prepared creditably to enter the university as a student. Some have supposed that by means of lip-teaching intelligent deaf-mutes might become pupils



Bell's visible speech.

in the common schools. Itard and his successor, Blanchet, in France, and the Abbé Carton, founder of an institution for the deaf and dumb in Bruges, Belgium, are among those who have especially labored on behalf of the method of teaching by articulation. This method was at first employed at Northampton, Mass., but has now given place to the Bell system. See VISIBLE SPEECH.

A new method of teaching articulation by what is called *visible speech* has been introduced. It was invented in 1848 by A. Melville Bell, a professor in Edinburgh of vocal physiology. It consists of a species of phonetic writing, based not upon sounds, but on the action of the vocal organs in producing them. The characters of this universal alphabet, as matured in 1864, reveal to the eye the position of those organs in the formation of any sound which the human mouth can utter. In 1869 the first attempt was made in Great Britain to apply this alphabet in the instruction of deaf-mutes; and in 1872 it was introduced by A. Graham Bell, the son of the inventor, into the Clarke Institution at Northampton, where it has superseded the old method of imitation, and is the only method of teaching articulation used. Revised by EDWARD M. GALLAUDET.

Deafness: loss or imperfection of hearing; may be congenital or acquired, permanent or temporary, complete or incomplete. It may be (1) "nervous"—that is, caused by organic or functional disease of the auditory nerve or of the brain itself. Deafness of this kind is sometimes curable, but frequently it is permanent. It may be (2) the result of local disease or accident. Disease of the structures of the ear frequently follows scarlet fever, and is often of a scrofulous character. When such disease leads to organic changes, even if they be slight, permanent, and perhaps complete, deafness may result. (3) Cerumen (ear-wax) frequently fills the passage of the ear. In such cases oil should be dropped into the ear, and a gentle flow of warm water from a syringe will generally remove the obstruction. (4) When the *membrana tympani* (ear-drum) is accidentally perforated, much good is often done by the use of Toynbee's artificial ear-drum. (5) The Eustachian tube may be the seat of mucous inflammation, and may require surgical treatment. Counter-irritation behind the ears, the use of general tonics, etc., may be beneficial; and this is more especially true of the deafness of aged people. See Toynbee on *Diseases of the Ear* (1860); Roosa, *On Diseases of the Ear* (new ed. 1874). Since the year 1844, when the attention of physicians was first called to the subject, the growth of minute fungi (*Aspergillus*, etc.) in the ear has been reported to be a common cause of disease of that part. The meatus and tympanum are sometimes covered with the growth, in the form of white or yellow mould on their surfaces. Tinnitus, inflammation, and the accumulation of wax are attendant symptoms, and the treatment consists in the application of a solution of carbolic acid, 5 grains to the ounce of water. The fungi are perhaps the effects of disease rather than the cause.

Deák, dā'ăk, FRANCIS: Hungarian statesman and orator; b. at Kehida in the county of Zala (Szalad), Oct. 17, 1803. He studied law, which he practiced in his youth, was elected to the National Diet in 1832, and became the leader of the liberal party. Soon after the revolution of Mar., 1848, he became Minister of Justice, and projected important reforms in that department. He resigned office when Kossuth obtained power in Sept., 1848. On the defeat of the Hungarian patriots in battle, in 1849, he quitted public life and retired to his estate. Having been elected to the Diet in 1861, he became the leader of the moderate party and the most popular man in Hungary. He was the author of the address sent by the Diet to the emperor requesting the restoration of the constitution of 1848, and of the protest against the imperial rescript in 1861. Deák is regarded as the master-spirit of the movement by which the constitutional autonomy of Hungary was restored in 1867, and large concessions to civil and religious liberty were extorted from the emperor. From that time he remained the recognized leader of the liberal party, commonly called after him, the "Deákist," and which had without interruption a majority of the Hungarian Diet. He refused all offers of a place in the ministry, but no change in the ministry was made without his consent. D. in Pesth, Jan. 29, 1876.

Deal [from Dutch *dēle* (Mod. *deel*): O. H. Germ. *dili*, *dilla*, Mod. Germ. *Diele*, plank, cogn. with Engl. *thill*. The word in Eng. often confused with *deal*, part, cogn. with Germ. *Theil*]: a commercial name for boards exceeding 6 feet in length and 7 inches wide. When 7 inches or less wide they are called battens. Deals are generally 3 inches in thickness and 9 inches in width; when thinner they are usually called planks, but thin boards are often called deals. The word deal is commonly used in Great Britain and rarely in the U. S.

Deal: a maritime town and bathing-place of Kent, England; on an open beach of the North Sea, near the southern extremity of the Downs; 8 miles N. N. E. of Dover, and 89 miles by rail from London (see map of England, ref. 13–M). It has been one of the Cinque Ports since the early part of the thirteenth century. A good anchorage extends between Deal and Goodwin Sands, 8 miles distant; the principal activity of the town is in boat-building and its trade in provisions and naval stores. It is also much frequented for the excellent bathing it affords. Here, in 1539, Henry VIII. built three castles, Deal, Sandown, and Walmer, in the last of which the Duke of Wellington died in 1852. Cæsar landed near Deal in 55. Pop. (1891) 8,898.

Dealfish [so called because to the resemblance of its body to a *deal*, or narrow board]: the *Trachypterus arcticus*, a species of the family *Trachypteridæ*, 4 to 6 feet long, found in northern latitudes in Europe. An allied species occurs on the west coast of the U. S.

Dean (from Lat. *decanus*, from *decem*, ten, because the dean anciently presided over ten canons): an ecclesiastical title applied to officers of several different kinds. In some of the Anglican churches deans are dignitaries next in rank to the bishops. They preside over the chapters of canons and prebendaries, and in the old dioceses nominally elect the bishops. In England they are attached to each diocese. Rural deans are inspectors of parishes, who make report of their visitations to the bishop. In the Roman Catholic Church in the U. S. every diocese possesses, according to the third Plenary Council of Baltimore, a number of deans appointed by the bishop and charged with a certain supervision of their ecclesiastical district. Deans of college faculties were originally the presiding or executive officers; now the faculty is generally presided over by the head of the university. The dean in English colleges presides in chapel, and has charge of the discipline. Few universities in the U. S. have deans, but in these their duties are similar to those of deans in English colleges. The head of a distinct department of instruction is often called dean of that college; there may be besides a dean of the university. The title dean is also given to the oldest member in length of service of an organized body, as dean of the diplomatic corps. Revised by C. K. Adams.

Dean, Amos, LL. D.: lawyer; b. at Barnard, Vt., Jan. 16, 1803; graduated at Union College in 1822; became an eminent lawyer, and was a Professor of Medical Jurisprudence in the medical school and of law in the law school at Albany, N. Y. He was the author of many valuable law treatises, and also published *Philosophy of Human Life* (1839), *Medical Jurisprudence* (1854), and other works. His *History of Civilization* (7 vols. 8vo) was published in 1868–69. D. Jan. 26, 1868.

Dean, Forest of: a picturesque hilly tract, having an area of 22,000 acres, in Gloucestershire, England, between the Severn and the Wye. It is mostly the property of the crown, and nearly half of it is inclosed for the growth of timber for the navy. Here are forests of oak, beech, and other trees, coal and iron mines, and stone-quarries. It was once a royal forest, but was disafforested by Charles I. In the reign of Charles II., however, it was completely reafforested by act of Parliament. The inhabitants, who number between 10,000 and 12,000, formerly enjoyed many privileges acquired partly by birth and partly by working a year and a day in the forest. Many of these privileges have been defined by acts and commissioners' awards, and now have full legal force. The forest is under the control of the commissioners of woods and forests, who have as subordinates in the regulation of the forest a gaveler, a deputy surveyor, four verderers, etc.

Dean of the Chapel Royal: a title in the Presbyterian Church of Scotland; a misnomer, inasmuch as this Church has no deans. The title is held by three clergymen of the Established Church, and is a mere remnant of episcopacy. The duties of the office are merely nominal, consisting in an occasional sermon before the Queen when she visits Scotland, but the revenues are considerable. The occupants are appointed by the crown, and recent appointments have been conferred in connection with chairs in the University of Edinburgh not otherwise endowed.

Dearborn, Henry: general; b. in North Hampton, N. H., Feb. 23, 1751; served as captain at the battle of Bunker Hill 1775, and as major in the campaign against Burgoyne in 1777. In 1778 he fought with distinction at Monmouth. He was a member of Congress from Massachusetts 1793–97, and Secretary of War under Jefferson 1801–09. Having obtained the rank of major-general, he captured York (now Toronto) in Canada Apr. 27, 1813. He was U. S. minister to Portugal 1822–24. D. in Roxbury, Mass., June 6, 1829.

Dearth, Henry Golden: landscape-painter; b. in Bristol, R. I., 1863. Pupil of Hebert and Aimé Morot, Paris; member Society of American Artists 1889. His pictures are marked by fine qualities of color, and show much truth of observation. His subjects are chiefly drawn from the scenery on Long Island and in Connecticut. Studios in New York and East Hampton, L. I. W. A. C.

Deasy, Rickard, LL. D.: an Irish Roman Catholic statesman and jurist; b. 1812, and educated at the University of Dublin (Trinity College); called to the bar in 1835; became queen's counsel in 1849, a serjeant-at-law in 1858, solicitor-general for Ireland in 1859, attorney-general in 1860, and a baron of the Irish exchequer in 1861. He was M. P. 1855–61, belonging to the "moderate Catholic" party, and representing the county of Cork; judge of court of appeals after 1878. D. May 6, 1883.

Death (in Gr. *θάνατος*; Lat. *mors, mortis*; Fr. *mort*; Germ. *Tod*): the cessation of vital functions in animals and plants. The active phenomena observed after death, such as material decay and loss of heat, are merely continuations of processes which have been going on through life. The corresponding operations of repair having ceased, the destructive processes become manifest. In a short time, however, in ordinary conditions, new and much more rapid destructive changes are induced.

Local or partial death of an animal is called mortification, gangrene, or sphacelus; if in a bone it is necrosis. Molecular death of animal tissue is called ulceration, except in bony tissues, when it has the name of caries. Systemic death is said by Bichat to be either—1, by syncope or fainting, when the heart's action fails from lack of its usual stimulus; 2, by asphyxia, when suffocation occurs or the lungs cease to act; or, 3, by coma, when death begins at the brain. Other authorities add to these forms death by (4) changes in the character of the blood, as some forms of death by poisons from without or developed in the body in disease. It would be difficult to assign some instances (such as instantaneous death from an injury) to any one of these categories. Sudden death is perhaps most frequently due to heart disease, but heart disease kills by slow death much more frequently. It is asserted by many careful observers that death is usually painless, and that the apparent agony or struggle so often observed is automatic. Cases are on record of burial after apparent death, but few of these are reliable. There is very little danger of such an occurrence when ordinary precautions are taken. A number of "signs" of death have been offered, and it is by the presence of all of them that certainty is reached. Among these the method of testing for breathing by a feather or cold mirror, or by a glass filled to the brim with water placed on the chest, the absence of heart-beats or sounds, the staring of the eyes, etc., are well known. W. P.

Death Adder: See Acanthophis.

Death-bed Declarations: See Dying Declarations.

Death, Brothers of: a name sometimes given to the monks of the order of St. Paul the Hermit, which was suppressed by Pope Urban VIII. about 1630. They always carried with them a skull, to remind them continually of death.

Death, Dance of: See Dance of Death.

Death, Punishment of: See Capital Punishment.

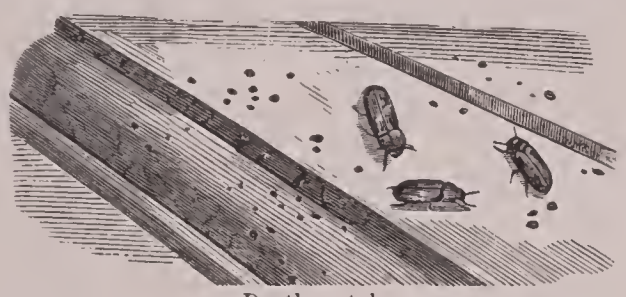
Death-rate: See Vital Statistics.

Death's-head Moth: See Acherontia.

Death Valley (so called because a party of emigrants perished there from thirst and starvation in 1849): a narrow valley of California, 130 miles in length, trending nearly northwest and southeast, and walled at the sides by the Panamint and Funeral Mountains. The middle and lowest portion of the valley bottom is a plain covered by a layer of glittering white salt. This plain lies between 300 and 400 feet below sea-level. Toward the N. W. the surface rises to the foot of Mt. Magruder, which stands at the head of the valley; toward the S. E. there is a more gradual rise to the end of the Funeral Mountains, where the valley coalesces with arms of the Amargosa des-

ert of Nevada and the Mohave desert of Southern California. The so-called Amargosa river, a long and broad channel, usually dry through the greater part of its length, drains a large desert tract in Southern Nevada, and crossing the Amargosa desert with a southward course curves about the south end of the Funeral Mountains and enters Death Valley. It is probable that the channel carries water only at rare intervals, but the volume of its torrent must occasionally be great. Whatever water it brings to Death Valley must gather as a lake in the bottom of the valley until evaporated by the sun, and the salt accumulated in the valley has unquestionably been brought by such torrents from the surrounding deserts. In connection with a scientific expedition sent to the valley in 1891 by the Department of Agriculture, the U. S. Weather Bureau maintained a meteorological station for five months at the base of the Funeral range. During the month of July the mean temperature was 102° F.; the highest temperature was 122°; the mean of the highest temperatures observed on the several days was 115·6°, and the mean of the lowest temperatures observed on the several days was 86·8°. The relative humidity for the same period was ·20. This record, although not made in the lowest part of the valley, indicates that the locality is the hottest and driest in the U. S., and it is not surpassed in these respects by any other place at which a record has been kept. G. K. G.

Death-watch: a small beetle inhabiting human dwellings, and producing a sound like the ticking of a watch. This sound being more readily heard in the stillness attending sickness, it has given rise to the superstitious belief that it prognostieates death; hence the name "death-watch." The noise is produced by the insect beating its head against the wood in which it is concealed. It is supposed to be the call of the male to its mate. The common death-watch (*Anobium notatum*) is a species of borer. It is about a quarter of an inch in length, and of a dusky-brown color. A number of species are found both in Europe and the U. S. The *Atropos pulsatorius*, a very different insect, is called in England by the same popular name, and for the same reason.



Death-watch.

Debatable Land: a tract of country at the head of the Solway Firth on the western border of Scotland and England; lying between the Esk and Sark. It was for a long time a cause of contention between the two countries, and even after its division by royal commissioners in 1542 continued to be a refuge for outlaws. It was divided by a line drawn from E. to W. between the rivers, the southern part being adjudged to England and the northern half to Scotland.

Débat-Ponsan, dā'baa'pōṅ'saaṅ', Édouard Bernard: figure and portrait painter; b. at Toulouse, Apr. 25, 1847; pupil of Cabanel; second Prix de Rome 1872; second-class medal, Salon, 1874; Legion of Honor 1881; third-class medal, Paris Exposition, 1889. His portraits are excellent, vigorously painted, and good in character. *A Doorway of the Louvre*, *Massacre of St. Bartholomew*, is in the museum at Clermont. Studio in Paris. William A. Coffin.

Debenture [from Lat. *deben'tur*, 3d plur. pres. indic. of *debe're*, owe;—acknowledgments of debt formerly began with the words *debentur mihi*, there are owing to me]: a document or writing acknowledging a debt. The term is particularly applied to (*a*) custom-house certificates that an exporter is entitled to a bounty or Drawback (*q. v.*). (*b*) One of a series of instruments, usually under seal, in which the party issuing them covenants to pay the sum therein declared to be owing to the holder at a certain time with interest. Usually this debt is made a charge upon a fund or subject of property specified or referred to. Public companies, especially railroad companies, have frequently resorted to these to raise special loans. The terminability and fixity in amount of debentures being often objectionable to lenders, debenture stock in many cases has been issued. This is frequently irredeemable, and may be transferred in any amount. The holder is entitled to a preferred rate of interest, which is a charge upon the assets of the company next to mortgages.

Revised by F. Sturges Allen.

De'bir [Heb., in the rear]: a city of the tribe of Judah several times mentioned in the Bible; situated W. of Hebron in the hill-country, and in a dry and arid place. It was captured by Joshua, and subsequently by Othniel; was inhabited by the Anakim, and had a Canaanitish king. It was afterward given to the priests of the Hebrews. It was also called Kirjath-sepher (town of the book) and Kirjath-sannah (town of the law), names seeming to indicate that a school or an oracle was situated there. Its site is not at present accurately known. There was also a place of this name near Jericho, and probably another belonging to the tribe of Gad, E. of the river Jordan.

Déblai, dā'blā' [Fr., excavation, clearing, connected with *déblayer*, clear of rubbish, etc.; O. Fr. *blef* (Mod. Fr. *blé*, grain): Ital. *biado* < Lat. *abla'tum*, ptc. of *aufer're*, i. e. what is borne away, as grain from the field]: in fortification, the mass of earth taken from an excavation in the ground in order to form a parapet. The earth used to form the entire rampart or parapet is called the remblai.

Deb'orah: a Hebrew prophetess and judge; the wife of Lapidoth; gained celebrity by her successful efforts to liberate the Israelites from Jabin, King of Canaan. (See Judges iv.) She is supposed to have composed the spirited lyric which forms the fifth chapter of Judges, a pæan over the victory, describing the battle in the most vivid colors.

De Bow, James D. B.: See the Appendix.

Debreczin, dā-bret'sin: a royal free town of Hungary; capital of the county of Bihar; on an extensive sandy plain 116 miles E. of Budapest (see map of Austria-Hungary, ref. 6–J). The houses are mostly only one story high; the streets are unpaved and dirty. It contains a handsome town-hall, several hospitals, and a Protestant college with twenty-four professors, over 1,000 students, and a valuable library. It has manufactures of flour, saltpeter, earthenware, soap, hams, sausages, and tobacco-pipes. Here are extensive markets for cattle and swine. A large majority of the inhabitants are Protestants and Magyars. It is connected with Pesth by a railway. Pop. (1890) 58,952.

De Bry, or **De Brie**, Théodore: goldsmith, engraver, and printer; b. at Liége, 1528. About 1570 he removed to Frankfort-on-the-Main, where he established a printing and engraving house, his two sons, Jean Théodore and Jean Israel, taking part in the engraving work. They made many plates of great excellence for that period, which were published in various works; but the name is best known in connection with the great collection of travels first published in 1590 with the title *Collectiones Perigrinationum in Indiam orientalem et occidentalem.* The designs for this work, as in most of those of the sixteenth century, are more or less fanciful. The volumes were republished in German and Latin with various changes, and it is now nearly or quite impossible to unite specimens of all the editions. It is said that the most complete collection in the world is that of the Lenox Library, New York. De Bry died at Frankfort in 1598. Herbert H. Smith.

Debt: in law, a sum of money due which is certain in amount or capable of being reduced to certainty. Such an indebtedness may arise either as the result of a judgment of a court of justice, or on a sealed instrument (specialty), or on an unsealed instrument, or on a mere oral contract. Debts are thus distinguished into such as are of record, or of special contract or simple contract. They may arise either on an express or implied promise. Debts may be collected by an action of debt, or in some instances by an action of covenant. The last action is resorted to when the duty to pay is derived from a contract under seal. The form of action called *indebitatus assumpsit* (being indebted, he promised) may also be used where the indebtedness is incurred by reason of a simple contract. A debt may be discharged in various ways, as by Accord and Satisfaction, Release, Payment, Novation (*qq. v.*), etc. The statute of limitations will be a bar to an action. The time within which the action must be brought under such a statute varies in the different States. See Limitations, Statute of.

Action of Debt is a common-law action brought to collect a debt. It is also used to collect a penalty given by statute. When an action of debt is brought on a written instrument the defendant may deny its existence. If he as-

serts that there is no such record as the plaintiff alleges his plea is called *nul tiel record*; if he claims that a sealed instrument which is set up as the foundation of an indebtedness was never executed his plea is *non est factum*. These pleas merely deny the *existence* of the judgment or specialty. If he has any other defense he should disclose it by specially setting it forth. So he may deny the existence of a simple contract debt, or may set up in his pleadings any special facts which, while they admit the existence of the debt, show that the plaintiff has no right to recover. A judgment in the action for the recovery of a debt itself constitutes a new debt, on which another action may be brought, and so on, unless there be some statutory restriction of the right to bring an action upon a judgment, as there is in some of the American States. Under the codes of procedure of some of the States the technical action of debt no longer exists, as there is but one civil action. The same remedy may be had in substance under a complaint setting forth the facts constituting the cause of action. T. W. DWIGHT.

Debt, Public: The bulletin of the U. S. census for 1890, published in 1897, shows the aggregate debt of different nations in 1880 and 1890 to have been as follows:

NATURE OF DEBT.	TOTAL DEBT LESS SINKING FUND.		PER CAPITA.	
	1890.	1880.	1890.	1880.
National debt of foreign countries.	$26,621,222,135	$25,484,492,879	$32 88	$35 62
National debt of U. S.	891,960,104	1,922,517,364	14 24	38 33
State and local debt of U. S.	1,135,210,442	1,123,278,647	18 13	22 40

These figures show that the national debts of the world have increased somewhat, but that population has increased faster; that the local debt of the U. S. has remained nearly stationary, while population has increased nearly one-fourth; and that in spite of this last fact the national debt of the U. S. has been reduced one-half. "The average annual decrease in the national debt of the U. S. during the decade exceeded $100,000,000; the decrease per capita of combined national, State, and local debt during the same period was from $60.73 to $32.37, while other statistics show that the value of property assessed for taxation increased meanwhile from $17,000,000,000 to $25,500,000,000, or 50 per cent., indicating a reduction of public debt and an increase of wealth for the country unprecedented, at least in modern times."

The national debt of various foreign countries in 1890 was as follows:

NATIONS.	Total.	Per capita.
France	* $4,446,793,398	116
Russia	3,491,018,074	31
Great Britain	3,350,719,563	88
Austria-Hungary	2,866,339,539	71
Italy	2,324,826,329	76
Spain	1,251,423,696	74
Prussia	1,109,384,127	37
Netherlands	430,589,858	96
Belgium	380,504,099	63
Bavaria	335,503,105	60
India	881,003,592	3
Egypt	517,278,200	76
Japan	305,727,819	8
New South Wales	233,289,245	215
Brazil	585,345,927	42
Peru	† 382,175,655	146
Argentine Republic	284,867,069	70
Canada	237,533,212	48

The debt of Turkey was not given in the census list, but it amounts to some $600,000,000, or about $22 per capita. No other country is reported with a debt as high as $200,000,000, though some of the Australasian colonies come very near it. The per capita debt of New Zealand is conspicuously large ($298). These large Australasian loans, being issued for public works, do not burden the country as much as they otherwise would.

Strictly speaking, the debt of Prussia, Bavaria, and other German states is local; but the national debt of the German empire as a whole is only $77,000,000. With this exception the local debt of foreign nations is not reported. That of various States of the Union is as given in the table in the next column.

* Not including terminable annuities capitalized at $2,000,000,000.
† Not including irredeemable paper outstanding.

DEBT OF STATES OF THE UNION.

GEOGRAPHICAL DIVISIONS.	TOTAL OF STATE AND LOCAL DEBT LESS SINKING FUND.		PER CAPITA OF COMBINED DEBT.	
	1890.	1880.	1890.	1880.
North Atlantic	$467,968,615	$540,840,297	$26 89	$37 28
Maine	15,600,777	23,235,980	23 60	35 81
New Hampshire	8,148,362	10,792,583	21 64	31 10
Vermont	3,785,373	4,499,188	11 39	13 54
Massachusetts	81,550,027	91,909,651	36 42	51 55
Rhode Island	13,042,117	12,971,063	37 75	46 91
Connecticut	23,703,478	22,001,661	31 76	35 33
New York	201,763,217	218,845,804	33 64	43 06
New Jersey	49,333,589	49,382,675	34 14	43 66
Pennsylvania	71,041,675	107,201,692	13 51	25 03
South Atlantic	165,107,113	167,919,910	18 64	22 10
Delaware	2,919,084	2,371,296	17 32	16 17
Maryland	42,175,408	41,429,179	40 46	44 31
District of Columbia	19,781,050	22,498,323	85 86	126 66
Virginia	50,837,315	45,518,776	30 70	30 09
West Virginia	2,532,460	1,640,935	3 32	2 65
North Carolina	11,117,445	17,962,535	6 87	12 83
South Carolina	13,295,637	14,185,060	11 55	14 25
Georgia	20,272,095	19,648,265	11 03	12 74
Florida	2,176,619	2,665,541	5 56	9 89
North Central	320,238,281	246,058,507	14 32	14 17
Ohio	71,065,386	53,044,175	19 35	16 59
Indiana	24,442,631	18,352,649	11 15	9 28
Illinois	41,841,649	46,388,888	10 94	15 07
Michigan	16,941,928	12,055,902	8 09	7 36
Wisconsin	10,440,580	12,085,984	6 19	9 19
Minnesota	26,050,929	11,328,433	20 01	14 51
Iowa	11,275,319	8,137,767	5 90	5 01
Missouri	51,557,568	60,263,761	19 24	27 79
North Dakota	3,842,790	131,726	21 03	3 57
South Dakota	6,613,707	867,134	20 11	8 82
Nebraska	15,536,772	7,489,974	14 67	16 56
Kansas	40,629,022	15,912,114	28 47	15 97
South Central	138,255,311	143,982,958	12 60	16 14
Kentucky	19,432,885	14,982,449	10 46	9 09
Tennessee	29,543,843	40,750,137	16 71	26 42
Alabama	18,930,867	18,007,774	12 51	14 26
Mississippi	6,011,347	4,955,789	4 66	4 38
Louisiana	33,335,497	42,865,471	29 80	45 60
Texas	20,172,063	11,688,198	9 02	7 34
Oklahoma	.....	.....	.....	.....
Arkansas	10,828,809	10,733,140	9 60	13 37
Western	43,641,122	24,476,975	14 41	13 85
Montana	2,918,893	765,248	22 09	19 54
Wyoming	1,647,381	205,462	27 14	9 88
Colorado	8,411,027	3,627,742	20 41	18 67
New Mexico	2,831,538	84,872	18 44	0 71
Arizona	2,937,971	377,501	49 28	9 33
Utah	767,501	116,251	3 69	0 81
Nevada	1,337,501	1,399,765	29 23	22 48
Idaho	1,594,333	229,882	18 89	7 05
Washington	3,145,658	239,311	9 00	3 19
Oregon	2,479,860	848,502	7 90	4 86
California	15,569,459	16,582,439	12 89	19 18
The United States	$1,135,210,442	$1,123,278,647	$18 13	$22 40

The different kinds of debt going to make up this total were as follows:

NATURE OF DEBT.	1890.	1880.
State	$228,997,389	$297,244,095
County	145,048,045	124,105,027
Municipal	724,463,060	684,348,843
School districts	36,701,948	17,580,682

The principles involved in the creation of public debts are discussed under FINANCE (*q. v.*). The purposes for which the local debts of the U. S. were created are reported as follows in the census of 1880. No returns are available for 1890:

Bridges	$24,853,388
Cemeteries	283,816
Fire department	2,514,082
Funding floating debt	153,949,095
River and harbor improvement	36,224,548
Parks and public places	40,612,536
Public buildings	48,493,952
Railroad and other aid	185,638,948
Refunding old debt	138,743,730
Schools and libraries	26,509,457
Sewers	21,370,536
Streets	86,674,860
Miscellaneous	130,138,633
War expenses	75,154,400
Water-works	146,423,565
Total	$1,117,585,546

The size of the "refunding" and "miscellaneous" items deprives the foregoing table of much of the value which it would otherwise possess.

With the exception of some important government railway loans (Prussia, India, Australia), national debts have generally been created for war purposes. Thus if the figures of the English national debt at successive dates are taken, the following results are obtained:

DATE.	Amount.	Concurrent events.
1689	£664,263	
1702	16,394,702	War of Spanish succession.
1714	54.145,363	
1763	138,865,430	End of Seven Years' war.
1786	249,851,628	After American war.
1793	244,440,306	French revolutionary war.
1802	571,000,000	
1817	848,282,477	After Napoleonic wars. Maximum of debt. English and Irish exchequers consolidated.
1830	840,184,022	Years of peace.
1840	789.578,720	
1850	787.029,162	
1854	775,041,277	Crimean war.
1856	807,981,788	
1860	802,190,300	
1870	*748,276,181	
1880	*737,821,259	
1890	*618,212,157	
1900	639,165,265	Transvaal war.

The following table shows the progress of the French debt:

DATE.	Nominal capital, millions of francs.	Concurrent events.
1800	724	End of First Republic.
1815	1,272	" First Empire.
1830	4,426	" Bourbons.
1848	5,913	" Orleans family.
1852	5,516	" Second Republic.
1871	12,454	" Second Empire.
1887	23,728	Third Republic.
1891	About 31,000	
1900	30,055	

The earlier U. S. debts were of the same character. The national debt on Jan. 1, 1791, was $75,000,000, and remained almost unchanged for the next fifteen years. At the beginning of 1812 it had fallen to $45,000,000, but rose rapidly in the war with Great Britain, and stood at $127,000,000 at the beginning of 1816. This debt was gradually paid off at maturity, and at the beginning of 1835 had been practically reduced to zero. In the years following a new debt grew up gradually, though somewhat unsteadily, amounting to $65,000,000 on July 1, 1860, the public credit at this time being very poor, owing to the dread of impending secession. The present debt is to all practical purposes a war debt. The war loans began with that authorized by the act of Feb. 8, 1861, of $25,000,000 at 6 per cent. for twenty years, of which $18,415,000 were issued, nominally at par, but really costing about $1\frac{1}{4}$ per cent. in negotiation. Next, on Mar. 2, 1861, treasury notes bearing 6 per cent. interest were authorized, of which $35,364,450 were issued. This was a most important act for the relief of the Government, the notes being received for customs, and being redeemable within two years. On July 17, 1861, $250,000,000 of 7-per-cent. bonds, to run twenty years, were authorized, with authority to issue any part of this amount in the form of treasury notes, running three years, at $7\frac{3}{10}$ per cent. interest (subsequently known as seven-thirties), or notes not bearing interest payable on demand, or treasury notes for one year at $3\frac{65}{100}$ per cent. interest, exchangeable for the seven-thirties: but the whole amount of demand notes not at interest shall not exceed $50,000,000. An act of Aug. 5, 1861, authorized the issue of bonds at 6 per cent. interest, running twenty years, to exchange for the one-year and three-year notes before authorized, with accumulated interest, at any time before or at their maturity; and the demand notes were declared receivable for all public dues. These acts were most wisely designed and signally successful; the demand notes, though at first rejected by the banks, before the close of the year were at a premium; and the interest-bearing notes became very acceptable, and were readily converted, with their accumulated interest, into the permanent 6-per-cent. bonds. The current of public preference was then changed in favor of the Government issues, which at first were received with aversion, particularly by the banks. A very large issue of these notes took place, the seven-thirty notes reaching $140,094,750, and the $3\frac{65}{100}$ per cent. one-year notes a large sum, with the full $50,000,000 of demand notes. Of the 6-per cent. twenty-year bonds issued in redemption of the one and three year notes, there were $189,321,200. On Feb. 12, 1862, $10,000,000 more of demand notes were issued.

The preceding very successful issues laid the basis for the first great popular loan, authorized Feb. 25, 1862, of $500,000,000 of 6-per-cent. bonds, redeemable after five and payable after twenty years—commonly called five-twenties. A large subscription was at once made, and the full $500,000,000 were issued. The acts of Mar. 3, 1864, and Jan. 28, 1865, added $15,000,000 more to the authorization. By this act of Feb. 25, 1862, $150,000,000 of circulating notes were authorized and made a legal tender; $50,000,000 to be in place of the demand notes of July 17, 1861. On July 11, 1862, $150,000,000 more were authorized, and on Mar. 3, 1863, $150,000,000 more—$450,000,000 in all. The whole amount was issued, and formed the great volume of currency known as *greenbacks*. Of this issue $400,000,000 was made permanent, but contractions in 1868 and 1869 reduced the amount to $346,681,016. The act of Feb. 25, 1862, also authorized the acceptance of $25,000,000 of deposits at 5 per cent. interest; this authorization was increased to $50,000,000 on Mar. 17, 1862, and to $100,000,000 on July 11, 1862. On June 30, 1864, a further sum of $50,000,000 was added, this to pay 6 per cent. interest; all this, described as temporary loan, was to be repaid on ten days' notice, and was so repaid in 1865 and 1866, except $78,560 unclaimed.

The act of Mar. 1, 1862, authorized the issue of certificates of indebtedness to public creditors in adjustment of any claims, such certificates to bear 6 per cent. interest, and to run one year. The sum of $561,753,241 of such certificates was issued, all except $4,000 of which were redeemed in 1863, 1864, and 1865. The act of July 17, 1862, authorized the issue of postage-stamps as currency, and made them receivable in payments to the U. S. in sums less than five dollars. An act of Mar. 3, 1863, authorized the use of fractional notes (parts of a dollar) in place of postal currency, limiting the amount to $50,000,000, which authorization was confirmed by the act of June 30, 1864. This issue was promptly called for to the extent of $30,000,000, and it was varied from that sum to the large amount of $45,722,061, outstanding Jan. 1, 1873. In the years beginning with 1875 it was rapidly withdrawn, and fractional silver substituted through the avails of 5-per-cent. bonds sold under the acts of 1870–71.

By act of Mar. 3, 1863, a loan of $900,000,000 was authorized at 6 per cent. for ten or forty years, principal and interest payable in coin, of which $75,000,000 only was issued, and taken at a premium of $3\frac{1}{2}$ to 4 per cent., preference being given because of a possible distinction existing adverse to the payment of the principal of the 5·20s in coin. This act was repealed June 30, 1864. The same act, Mar. 3, 1863, also authorized $400,000,000 of one, two, and three year treasury notes, at not over 6 per cent. interest, to be a legal tender for their face-value, principal and interest payable in lawful money. Of these there were:

One-year notes, issued	$44,520,000, at 5	per cent.	$39,865 out.
Two-year notes, "	166,480,000, at 4	"	30,600
Three-year notes (compound)	266,595,440, at 6	"	208,670

This act authorized the exchange of new treasury notes for any of these issues outstanding at any time, and provided for $150,000,000 more of currency, not at interest, to facilitate such exchange. In all, $477,595,440 of these treasury notes of 1863 were issued, practically all of which were canceled or exchanged before May 15, 1868. It will be seen that but a small amount of permanent loans was created in 1863, treasury notes being largely used.

An issue of $200,000,000 was authorized Mar. 2, 1864, at 5 or 6 per cent., payable in coin; $196,117,300 was issued at 5 per cent., redeemable in ten and payable in forty years in coin—the so-called ten-forties of 1864—and $3,882,500 at 6 per cent. On June 30, 1864, another loan of $400,000,000 was authorized at 6 per cent.—five-twenties of 1864—$125,561,300 being issued. The loans not being fully taken, the act of June 30, 1864, authorized the issue of $200,000,000 of seven-thirty treasury notes, to run three years, which authority was extended by act of Mar. 3, 1865, to embrace $600,000,000 more. Under this authority $829,992,500 of seven-thirty interest-bearing notes were issued, which were duly redeemed or exchanged before July 15, 1868.

* Plus a number of terminable annuities amounting to over £60,000,000 capitalized value in 1900.

The loans of 1865 began with the authorization of $600,000,000 of 6-per-cent. five-twenty bonds by act of Mar. 3, to be applied only to the reimbursement of treasury notes or other outstanding obligations of the Government. Two issues were made—on July 1, 1865, $322,998,950, and on Nov. 1, 1865, $203,327,250. By authority of the same act, as construed by act of Apr. 12, 1866, a further issue was made in July 1867, of $379,616,050, and of $42,539,350 on July 1, 1868, these sums being employed to retire treasury notes and other obligations, but not to increase the public debt.

All these were *funding* operations, whereby a definite obligation was substituted for an indefinite one. The *refunding* issues, whereby bonds at lower rates were substituted for similar bonds bearing higher rates, were inaugurated by the act of 1870. This act provided for the issue of $200,000,000 of 5-per-cent. bonds (increased to $500,000,000 in 1871), $300,000,000 of 4½-per-cents., and $1,000,000,000 of 4-per-cents. By the act of 1875 these issues were made available for use in the resumption of specie payments as well as in the refunding of the debt, and the possible amount considerably increased. The favorable conditions of the foreign trade in the years 1878 and 1879, coupled with the signal success of the resumption of specie payments, caused the 6 and 5 per cent. bonds to be largely retired in advance of maturity; a few were continued for a short time at 3½ per cent. or 3 per cent., under agreements of 1881 and 1882 respectively. All these have been since paid up, while nearly all the 4½-per-cent. bonds, and some of the 4-per-cents., have been purchased in the open market, long in advance of maturity, from the surplus revenues of the Government.

The deficiency in the revenue of the U. S. following 1892 showed itself in an increase in the national debt. The demand for gold coin, as distinct from silver or paper, was so great that the treasury could not safely meet it out of accumulated stocks, and was forced to issue bonds to replenish the gold reserve. The total amount of such bonds issued in Cleveland's administration (1893–97) was $262,315,000.

NATIONAL DEBT OF THE UNITED STATES SINCE 1860.

DATE.	Interest-bearing debt.	Non-interest-bearing debt.	Total debt less cash in treasury.	Annual interest charge.
July 1.	Millions.	Millions.	Millions.	Millions.
1860	64	...	59	3
1861	90	...	87	5
1862	365	158	505	22
1863	797	511	1,111	41
1864	1,359	455	1,709	78
1865	2,221	458	2,674	137
1865 (Aug. 31)	2,381	461	2,736	150
1866	2,332	439	2,636	146
1867	2,248	428	2,508	138
1868	2,202	408	2,480	128
1869	2,162	421	2,432	125
1870	2,046	430	2,331	118
1871	1,934	416	2,216	111
1872	1,814	430	2,149	103
1873	1,710	472	2,105	98
1874	1,738	509	2,104	98
1875	1,722	498	2,090	96
1876	1,710	405	2,060	96
1877	1,711	476	2,019	93
1878	1,794	455	1,999	94
1879	1,797	410	1,996	83
1880	1,723	388	1,919	79
1881	1,639	422	1,819	75
1882	1,463	438	1,675	57
1883	1,338	538	1,538	51
1884	1,226	584	1,438	47
1885	1,196	663	1,375	47
1886	1,146	619	1,282	45
1887	1,021	629	1,175	41
1888	950	739	1,063	38
1889	820	787	975	33
1890	725	825	890	29
1891	610	933	851	23
1892	585	1,001	841	23
1893	585	959	838	23
1894	635	995	899	25
1895	716	958	901	29
1896	847	921	955	34
1897	847	969	986	34
1898	847	948	1,027	34
1899	1,046	945	1,155	40
1900	1,023	1,112	1,107	33

ARTHUR T. HADLEY.

Decagon [from Gr. *δέκα*, ten + *γωνία*, angle]: a plane geometrical figure having ten sides and ten angles. If the sides and angles are all equal, the figure is a regular decagon, and inscribable in a circle. A regular decagon may be formed from a regular pentagon by describing a circle round the latter, taking the middle points of the intercepted arcs, and drawing lines joining every pair of adjacent angular points to the points of the intermediate section.

Decaisne, *de-kān'*, JOSEPH: botanist; b. in Brussels, Mar. 11, 1809; studied especially vegetable physiology, and was appointed assistant at the Jardin des Plantes in Paris in 1832, and director in 1851. He was for many years one of the directors of the *Annales des Sciences Naturelles*, and published a great number of scientific essays and papers. D. in Paris, Feb. 10, 1882.

Decalcoma'nie [from Fr. *décalquer*, counter-trace + *manie* = Gr. *μανία*, rage, madness]: the art of transferring pictures and designs permanently upon fabrics of various descriptions, china, glass, marble, wood, leather, etc. After carefully washing the article to be decorated, the picture to be applied is coated thinly with prepared cement, and then placed in the position required and pressed tightly with a cloth or rolled over with a heavy roller. Finally, a damp sponge is applied to the upper surface till the paper becomes sufficiently moist, after which it can be easily removed, and the picture will remain firmly on the object.

Decalitre [Fr.]: a measure equal to 10 litres. See LITRE.

Decalogue [Gr. *δεκάλογος*; *δέκα*, ten + *λόγος*, word, being a translation of Heb. עשרת הדברים]: that part of the law of Moses which is contained in Exodus xx. 3–17 and repeated in a hortatory form in Deuteronomy v. 7–21. We are accustomed to speak of it as the *Ten Commandments* and the "moral law," but these terms are not applied to it in the original Scripture; the phrase there is "the ten words." It was originally written, apparently, by Moses in the "book of the covenant," Ex. xxiv. 4, having been given orally from Sinai. Later, for covenant purposes, God gave a copy of it, written by himself, upon two tablets of stone (Ex. xxxi. 18, etc.), which were placed within the ark of the covenant. The text of Ex. xxxiv. 1, 28 appears to fix the number of these "words" at ten, but various opinions exist as to the manner of dividing them. The arrangement recognized by the Greek Church and most Protestants, called the Origenian division, is that which was approved, though not originated, by Origen. It had been approved by Philo and Josephus, and was generally adopted by the Christian Church. But in the West it faded out, and was revived by Leo Judæ (1482–1542) in his catechism, 1534, and by Calvin, 1536. The Roman Catholics, at least in their catechisms, unite into one what most Protestants consider the first and second commandments, and divide the tenth Origenian commandment into two. This was Luther's arrangement, and is generally, though not universally, followed by the Lutheran Church. It is called the first Masoretic arrangement. The modern Jews adopt what is called the Talmudical arrangement, which gives as the first commandment the words contained in Ex. xx. 2, and has for its second commandment the first and second of the Origenian arrangement. The second Masoretic, adopted by English Roman Catholics, differs from the first Masoretic only in inverting the order of the ninth and tenth commandments. The ten commandments, with the exception of the two regarding the Sabbath and reverence to parents, are negative ones, forbidding certain actions, and leaving positive precepts to other laws or to the individual conscience. The Decalogue is generally regarded as a moral code, binding from its own nature, though the Sabbath commandment has a positive as well as a moral element in it. Christ, in common with the Pharisees, regarded the whole law (not the "ten words" merely) as summed up in two precepts.

Revised by W. J. BEECHER.

De Camp, JOHN C.: rear-admiral U. S. navy; b. in New Jersey, Oct. 5, 1812; entered the navy as a midshipman Oct. 1, 1827. He commanded the Iroquois at the passage of Forts St. Philip and Jackson and capture of New Orleans, and, in short, in every action on the Mississippi under Farragut, to and including Vicksburg, in all of which he was conspicuous for gallant bearing. D. in Burlington, N. J., June 24, 1875.

De Camp, JOSEPH RODEFER: figure and landscape painter; b. in Cincinnati, Nov. 5, 1858. Pupil of Frank Duveneck, Munich; member Society of American Artists 1888. His later work, especially in landscape, shows the influence of impressionistic methods, and it is notable for direct realistic treatment. Studio in Boston. W. A. C.

Decamps, *dā'kaṅ'*, ALEXANDRE GABRIEL: genre and landscape painter; b. in Paris, Mar. 3, 1803. Pupil of David and of Ingres. He at first followed the classical traditions

of David, but became with Delacroix and others a leader in the Romantic school of 1830. His pictures are notable for depth and richness of tone. His *Caravan* and *Towing-horses* are in the Louvre; *Night-watch at Smyrna* in the Wolf collection in the Metropolitan Museum, New York; and *The Suicide* in the collection of W. T. Walters, Baltimore. D. at Fontainebleau, Aug. 22, 1860.

WILLIAM A. COFFIN.

De Candolle, de-kăăn'dōl', AUGUSTIN PYRAME, M. D.: botanist of French extraction; b. in Geneva, Feb. 4, 1778. He studied at Geneva and afterward in Paris, where he became a pupil of Desfontaines, and enjoyed the friendship of Cuvier and Humboldt. Lamarck's *Flora of France* (1804–05) was prepared by him. He became in 1808 Professor of Botany at Montpellier, and published in 1813 his *Elementary Theory of Botany*, a profound work, in which he developed his new system of classification according to the natural method. In 1816 he removed to Geneva. He projected a great work which should give a description of all known plants, and published two volumes (1818–21), with the title *Regni Vegetabilis Systema Naturale*, but modified his plan and undertook the well-known *Prodromus Systematis Naturalis Regni Vegetabilis* (17 vols., 1824–73), which he did not live to finish. Among his other works is *Organographie Végétale* (1827). D. in Geneva, Sept. 9, 1841.—His son, ALPHONSE LOUIS PIERRE DE CANDOLLE, b. Oct. 28, 1806, wrote several botanical works; published his father's *Mémoires et Souvenirs* (1862); continued the *Prodromus*, and began the *Monographiæ Phanerogamarum* (1878). D. Apr. 9, 1893.—CASIMIR PYRAMUS DE CANDOLLE (son of Alphonse, b. 1836) has aided in the preparation of the *Prodromus* and the *Monographiæ*.

Decapitation [from Lat. *de*, off + *caput*, head]: a form of CAPITAL PUNISHMENT (*q. v.*) in which the head is severed from the body by an executioner. Under the English Government hanging has taken the place of decapitation, the last instance of the latter having occurred in 1745. This mode of punishment is still used in some of the German states and in France. In France the GUILLOTINE (*q. v.*) is still used. Decapitation is of very ancient origin. It is a frequent punishment among Oriental nations.

Decap'oda [from Gr. δέκα, ten + πούς, ποδός, foot]: a subclass of Crustacea, most of whose members are characterized by having ten walking feet. The limits of the group vary in the estimation of various authors; as here used it is equivalent to *Podophthalmia*, or stalk-eyed Crustacea. The body is divided into two regions, an anterior cephalothorax bearing the organs of sense, of eating, and of locomotion, and a posterior seven-jointed abdomen. The eyes are placed on jointed stalks; the walking legs are ten to fourteen in number. The group contains the largest and best known of the Crustacea. It is divided into the *Cumacea*, the *Stomapoda*, the *Schizopoda*, and the *Decapoda* proper. In the latter there are but ten walking feet, some of which may be armed with pincers; and in the adults these legs have but one principal branch. The true Decapods are divided again into *Macrura* (with a long abdomen like a lobster) and *Brachyura*, with a short abdomen folded under the cephalothorax, as in the crabs. See LOBSTER, SHRIMP, CRAB, etc.

J. S. KINGSLEY.

Decap'olis [Gr. δεκάπολις; δέκα, ten + πόλις, city]: ten cities of Palestine leagued together, like the Hanse towns, and having certain privileges not now known. Decapolis is described by Eusebius in his *Onomasticon* as "the part lying on the other side of the Jordan about Hippos, and Pella, and Gadara." The ancient lists vary. Ptolemy speaks of eighteen cities; Eusebius omits Scythopolis—the only one of the ten that was on the west side of the river; Damascus is sometimes named and sometimes omitted; Pliny's list includes Damascus and omits Capitolias. They were mostly Greek cities, some of which, at least, were settled by the followers of Alexander the Great. They were subdued by the Maccabees (Josephus, *Ant.* xiii. 15, 4). When Pompey conquered the East (63 B. C.), he annexed them to Syria, detaching them from the Judæan government. Surrounded as they were by Jews, these cities then united in a defensive alliance. The original union was probably of these four: Hippos, Pella, Gadara, and Scythopolis (on the west side of the river). Afterward there were added Philadelphia, Gerasa, Dion, Raphana, Capitolias, and Canatha. Of these ten only Scythopolis, Gadara, and Canatha are now inhabited, though all but Raphana have been identified. Hippos has been identified with Fik; Pella with Tubakat Fah'l; Gadara with Um Keis; Philadelphia with Rabbath-ammon; Gerasa with Gerash; Dion with Eidun; Capitolias with Beit er Ras; and Canatha with Kunawat. Scythopolis, the ancient Beth-shean, is now called Beisan. See Selah Merrill, *East of the Jordan* (New York, 1881; 2d ed. 1883).

De Cassagnac, de-kăăs'săăn'yaak', PAUL GRANIER: French journalist, politician, most noted duelist of France, if not of Europe; b. Dec. 2, 1843; son of Adolphe Granier de Cassagnac, a zealous Bonapartist; succeeded his father as editor of *Le Pays*; has been since 1879 a member of the Chamber of Deputies; noted as a fiery Bonapartist and especially for his numerous affairs of honor. Author of *History of the Third Republic*.

C. H. T.

Deca'tur: city and railway junction; capital of Morgan co., Ala. (for location, see map of Alabama, ref. 2–C); on Tennessee river; 87 miles from Birmingham; has numerous churches, saw-mills, planing-mills, and a basket-factory. Pop. (1880) 1,063; (1890) 2,765; (1900) 3,114.

EDITOR OF "NEWS."

Decatur: town; capital of De Kalb co., Ga. (for location of county, see map of Georgia, ref. 3–G); on railway, 6 miles E. N. E. of Atlanta; in an agricultural district. Pop. (1880) 639; (1890) 1,013; (1900) 1,418.

Decatur: city and important railway center; capital of Macon co., Ill. (for location of county, see map of Illinois, ref. 6–E); situated about a mile N. of Sangamon river and 39 miles E. of Springfield. It has numerous manufactures, flouring-mills, large grain elevators, large railway car and repair shops, electric street railways, water-works, and paved streets. There are here two coal shafts. Pop. (1880) 9,547; (1890) 16,841; (1900) 20,754.

EDITOR OF "HERALD-DISPATCH."

Decatur: city and railway center; capital of Adams co., Ind. (for location of county, see map of Indiana, ref. 4–G); on St. Mary's river; 21 miles S. S. E. of Fort Wayne; has 9 churches, 2 public schools, a parochial school; has manufactures of wind-mills and engines, spokes and hubs, mill machinery, salt-glazed tile, and has 3 grist-mills; there are two stone quarries and a limekiln. Pop. (1880) 1,905; (1890) 3,142; (1900) 4,142.

EDITOR OF "DEMOCRAT."

Decatur: village; on M. C. Ry.; Van Buren co., Mich. (for location, see map of Michigan, ref. 8–H); 116 miles E. by N. of Chicago. Pop. (1800) 1,267; (1890) 1,109; (1900) 1,356.

Decatur: town; on railway; capital of Wise co., Tex. (for location of county, see map of Texas, ref. 2–H); beautifully situated 25 miles N. of Fort Worth; has 6 churches, a graded school, a college (Baptist), cottonseed-oil mill, canning-factory, ice-factory, and water-works. Pop. (1880) 579; (1890) 1,746; (1900) 1,562.

EDITOR OF "NEWS."

Decatur, STEPHEN: naval officer; b. in Newport, R. I., in 1751; son of a Huguenot refugee from Rochelle, France, who had served in the French navy as an officer, and who after his emigration married a lady who was a native of Rhode Island. Stephen Decatur removed to Philadelphia, Pa., when a young man, and there obtained command of a merchantman. During the war of the Revolution he commanded the Royal Louis and Fair American, and captured several British vessels. On May 11, 1798, hostilities with France having begun, he was appointed post captain in the U. S. navy, and was placed in command of the Delaware of twenty guns, which, during his cruise along the coast of the U. S. and in the West Indies, captured the privateers Le Croyable and Marsuin. In 1800 he was appointed to the command of a squadron of thirteen sail on the Guadeloupe station. In Oct., 1801, he was discharged from the service under the peace establishment, and engaged in business in Philadelphia. D. at Frankford, near Philadelphia, Nov. 14, 1808. His son, STEPHEN DECATUR (*q. v.*), attained great distinction in the navy.

Decatur, STEPHEN: commodore; b. at Sinnepuxent, Md., Jan. 5, 1779; entered the navy in 1798. In Feb., 1804, he led a small party which burned in the harbor of Tripoli the U. S. frigate Philadelphia after she had been captured by the Tripolitans. For this gallant exploit he was raised to the rank of captain. In the same year he added other deeds of valor to his record in the attacks upon Tripoli by Com. Preble's squadron. Having taken command of the frigate United States, he captured the British frigate Macedonian Oct 25, 1812. A gold medal was voted to him by

Congress for this victory. He was blockaded by a superior force in the harbor of New London in 1813–14. In May, 1815, he was appointed commander of a squadron of three frigates and seven smaller vessels, which was sent to chastise the Algerines. He captured two Algerine vessels of war June 17 of that year, and compelled the Dey of Algiers to sue for peace. He was killed in a duel by Com. James Barron Mar. 22, 1820. He was noted for his resolute spirit and cool intrepidity.

Decazes, dā′kaaz′, Élie, Duc de: French statesman; b. at St.-Martin-du-Laye, Sept. 28, 1780; became the trusted counselor of King Louis of Holland, and afterward secretary to Letitia Bonaparte; went over to the Bourbons in 1814; Minister of Police 1815; Minister of the Interior 1818. He was made Prime Minister in Nov., 1819, and tried to keep the balance between the radical and ultra-royalist parties, but was pleasing to neither. The murder of the Duke of Berry was turned into political capital by the royalists, who charged Decazes with complicity in the crime. He resigned; was created duke by the king, and sent as ambassador to England 1820–21. After the revolution of 1830 he supported Louis Philippe, and in 1834 became grand referendary of the chamber of peers. In 1818 he had been made Duke of Glücksburg by the King of Denmark. In 1846 he was accredited to that country on a special mission, but the latter part of his life was generally free from political concerns, and after 1848 spent in retirement on his estate of Decazeville. D. Oct. 24, 1860.

Decazes, Louis Charles Élie Armanien, Duc de: statesman; b. in Paris, May 29, 1819; eldest son of Élie Decazes. He early entered the diplomatic service, and was minister plenipotentiary to Spain and Portugal in 1848, but retired into private life when the Revolution broke out. In 1871 he was elected a member of the National Assembly. He took his seat in the right center, but, though he generally followed his party, he never openly and formally declared himself a monarchist. In 1873 he was appointed Minister of Foreign Affairs, and he retained that position till 1877, under exceedingly trying circumstances, but with dignity, enjoying the confidence both of the house of representatives and of the foreign cabinets. D. Sept. 17, 1886.

Decazeville, *dā′*kăaz′veel′: a town of France; department of Aveyron; about 20 miles N. E. of Villefranche (see map of France, ref. 8–F). It has extensive blast furnaces and iron-forges. Coal mines are worked in the vicinity. Pop. (1896) 9,634.

Dec′can, or **The Dekkan** [from Sanskrit *dakshiṇa-*, on the right hand, hence in looking east, the south, south country; cf. Gr. δεξιός, Lat. *dexter*, right hand]: a geographical term of historical importance, often applied to the whole of the peninsula of Hindustan S. of the Nerbudda river or Vindhya Mountains, but now often limited to the country between the Nerbudda and the Kistnah. It comprises Aurungâbâd, Bidar, Berar, Bijapur, Candeish, Gundwana, Northern Circars, and Orissa. The Deccan was first invaded by the Mohammedans in 1294, when Diogiri was stormed and pillaged. Over a quarter of a century later on, in 1325, the Mohammedans pushed their conquests still farther, and annexed to the empire of Delhi the whole country as far S. as the Kistnah. The name has been latterly applied to one of the larger political subdivisions of the Presidency of Bombay.

Revised by M. W. Harrington.

December [Fr. *Décembre*, from Lat. *decem*, ten]: the twelfth and last month of the year; so called because in the ancient Roman calendar it was the tenth month of the year. By the Anglo-Saxons it was called *Yule month* and *Mid-winter month*.

Decem′viri (sing. **Decemvir**) [Lat. *decem*, ten + *vir*, man, plur. *viri*]: a name applicable to ten persons appointed for particular purposes, but more especially applied to the ten magistrates elected from the Roman patricians to draw up a code of laws founded on the more approved institutions of Greece; they were also invested with supreme authority to govern the state. The experiment proved entirely successful; their laws were approved by the senate and engraven on ten metal tablets; and their official duties were discharged with so much satisfaction that, at the expiration of their year of office, it was resolved, as their work was not completed, to continue the same form of government. A new commission, invested with the same power, was appointed for the next year, to which the plebeians were admitted, the result of which was two additional tablets, thus completing the famous Twelve Tables which in subsequent times became the foundation of all Roman law. The new decemviri, however, proceeded to the most violent acts of despotism, perpetrating various outrages on the persons and families of the plebeians, which so exasperated the people that an insurrection broke forth; the decemviri were driven from office, and the ordinary magistrates were re-established.

The *decemviri litibus judicandis* (ten men for settling lawsuits) formed a kind of court for trying civil cases, and, later, for matters involving life and death. The *decemviri sacris faciundis* (the ten men for performing sacred duties), first instituted about 367 B. C., were five patricians and five plebeians who had charge of the Sibylline books until the time of Cicero, when they were made fifteen in number. They were considered sacred to Apollo. There were also decemviri for dividing the public lands.

Decennial [from Lat. *decen′nium*, period of ten years; *decem*, ten + *annus*, year]: occurring every ten years. For example, the U. S. census is decennial. The decennial games (*decennia* or *decennalia*) among the later Romans were celebrated in consequence of the fact that the Emperor Augustus pretended to refuse the empire for life, choosing to be elected to it for a period of ten years, at the end of which time he accepted it for ten years more, and so on till the end of his life. The fiction was kept up till the last days of the empire by the observance of the decennial games.

Deciduous Teeth [*deciduous* is from Lat. *deci′duus*, inclined to fall, deriv. of *deci′dere*; *de* + *ca′dere*, fall], called also, in mammals, *temporary* or *milk teeth*: those which appear in infancy and which after a time fall out, and are succeeded by the permanent teeth. In children there are twenty such teeth, ten in each jaw—four molar, two canine, and four incisor teeth. In reptiles and fishes all teeth are deciduous, being continually cast out and renewed.

Deciduous Trees: trees whose leaves fall in the autumn, leaving the branches bare of foliage during the winter. They are contrasted with the Evergreens (*q. v.*), in which the leaves remain upon the branches until after the appearance of the new leaves in the spring. There are many gradations between the two kinds. A tree which is deciduous in a cold climate will be evergreen or nearly so in a warm climate.

Decimal [from Lat. *decimus*, tenth]: a number written in the scale of tens. The name is especially applied to a Decimal Fraction (*q. v.*).

Decimal Fraction: a fraction whose denominator is a decimal number or power of ten. Thus $\frac{1234}{100}$ is a decimal fraction. It may be decomposed into the sum $\frac{1000}{100} + \frac{200}{100} + \frac{30}{100} + \frac{4}{100} = 10 + 2 + \frac{3}{10} + \frac{4}{100}$. By an obvious extension of the method of local values, where each digit has ten times the value of the like digit which immediately follows it, the above decimal fraction may be, and usually is, written thus: 12·34, where the decimal point after the 2 merely serves to indicate which digit represents *units*. In this form a decimal fraction is termed a *decimal*.

For the purpose of indicating the units' place the method of Sir Isaac Newton, of using a point placed for distinction near the top of the figures, is frequently used. The operations of addition, subtraction, multiplication, and division may be applied to decimals in exactly the same manner as to integers. The only additional rules in decimals refer to the position of the decimal point.

In their abbreviated form decimal fractions are now extensively employed in arithmetical calculations. A subdivision of weights and measures on the prineiple of decimal division was introduced into France at the time of the Revolution, and has since been adopted by a large portion of the civilized world under the name of the Metric System (*q. v.*).

Decimal System: See Metric System.

Decimation [from Lat. *decima′tio*, deriv. of *decima′re*, to decimate, to take by lot each tenth man for punishment]: in Roman history, the selection by lot of one man out of every ten, who was put to death in cases of mutiny or other grave offense committed by a body of troops. Decimation has seldom been practiced in modern times. Blücher decimated a body of mutinous troops before the battle of Waterloo, and Mexico occasionally practiced it, as in the case of the citizens of the U. S. captured in the expedition against Mier.

Decimi, dā'chĕe-mĕe [Ital., from Lat. *de'cimus*, tenth]: an Italian term used in music, signifying an interval of ten diatonic degrees, as from small c to the once-marked ē. The harmonic relations of the tenth are so similar to those of the third that in thorough-bass the same figure (3) denotes either. But while, from a harmonic standpoint, the tenth is considered simply as a third, an octave removed from its fundamental in counterpoint (polyphony), relations arise in which the tenth develops peculiarities, which require different treatment from that demanded by the third.

Decius, Caius Messius Quintus Trajanus: Roman general and emperor; b. in Pannonia about 200 A. D. Sent in 249 by the Emperor Philip to appease a sedition, his army revolted and proclaimed him emperor. Philip marched against him, but was killed in the battle which ensued. Decius himself was slain two years later by a shower of darts, and his army defeated while attempting to check the Gothic invasion.

Decius Mus, Publius: a Roman consul and patriot who obtained celebrity by devoting himself to the Dii Manes as a sacrifice. In a battle against the Latins (337 B. C.) he rushed into the midst of the enemy and was killed. His son, P. Decius Mus, imitated his example in 296 B. C., when he commanded against the Gauls.

Decker, or **Dekker**, Thomas: English dramatist; b. in London about 1570; began writing for publication as early as 1597; collaborated with Ben Jonson, Middleton, Webster, and many others; published in 1600 the comedies *The Shoemaker's Holiday, or the Gentle Craft*, and *The Pleasant Comedy of Old Fortunatus*; quarreled with Jonson, who satirized him in *Every Man out of His Humor* and other plays, and was ridiculed in turn in Decker's *Satiromastix, or the Untrussing of the Humorous Poet* (1602); was several times imprisoned for debt; according to his own account, was "three score" in 1637. Among the plays written in conjunction with others were *The Honest Whore, or the Converted Courtesan* (1604; second part, with Middleton, 1630); *The Roaring Girl*, with Middleton (1611); *The Virgin Martyr*, with Massinger (1622). He aided Rowley and Webster in the tragedy *The Witch of Edmonton* (published in 1658). Decker had a sprightly and humorous style, and was a realist in depicting the life of his time. He also wrote a number of pamphlets chiefly satirizing English social life; one of these, *Lanthorn and Candlelight* (1609), was republished as *English Villainies* (1637). These pamphlets were republished in Grosart's *Huth Library*, and a collection of his plays appeared in five volumes in 1873.

Declaration [Lat. *declara'tio*, deriv. of *declara're*, make clear (*clarus*), publish]: an affirmation; the act of declaring; a public announcement; a public expression of facts or opinions; a proclamation. Among the most memorable of all political documents are the Declaration of Independence (*q. v.*), of the British North American colonies, and the "Declaration of Rights" passed by the first Congress of those colonies at Philadelphia on Oct. 14, 1774. The Convention-parliament of England adopted a "Declaration of Rights" on calling William and Mary to the throne in 1689. A "Declaration of the Rights of Man" was adopted by the National Assembly at Paris Aug. 18, 1789. The "Declaration of Thorn" (Lat. *declaratio Thorunensis*) was a confession of faith drawn up at Thorn, in Poland, in 1645, for the use of the Reformed churches, the design being to settle controverted points. Revised by C. K. Adams.

Declaration: in common-law pleading, a specification of a cause of action by a plaintiff against a defendant; the pleading in which a plaintiff sets forth his case against the defendant. It contains certain formal or substantial parts, such as the title, venue, the cause of action, and the conclusion; it answers to the "bill" in equity. The declaration followed after the service of the writ of summons, and unless it was delivered within a certain time the defendant could obtain a judgment of *non pros*. In Great Britain the declaration is no longer in use in actions, being superseded by a "statement of claim" under the Judicature Acts, and in the U. S. the term "complaint" is used in the code States to designate the plaintiff's statement of his cause of action. The term is used in other branches of the law, as in declaration of trust, declaration of uses, declaration in evidence, etc., where it has its general sense of an express or explicit statement, an asseveration or acknowledgment of a fact, purpose, or intent. Revised by F. Sturges Allen.

Declaration of Independence: the act by which the thirteen British colonies of North America asserted their independence of the mother country. The first Congress of the thirteen British colonies, which led to their ultimate union in resistance to the British crown, and their jointly throwing off their allegiance to the same, as well as their ultimate union as the United States of America, met in Philadelphia Sept. 5, 1774. The immediate cause of this assemblage was what was called "the Boston Port Bill"—that is, an act of Parliament by which the port of Boston was closed and the custom-house removed to Salem, because of the destruction of the tea at the former place. This was looked upon by the friends of constitutional liberty in all the colonies as a direct attack by usurpation upon the chartered rights of Massachusetts. If they should silently permit this gross outrage to be perpetrated upon a sister colony they saw no security against similar outrages being perpetrated in turn upon their own chartered or constitutional rights. It was now that the cry of "The cause of Boston is the cause of us all" was raised in Virginia, and extended from the Penobscot to the Altamaha. The result was the call of a general congress of all the colonies, to meet, by deputies, at the time and place stated, for joint consultation and joint action in maintenance of principles essential to the preservation of the rights and liberties of all. The idea of independence or separation was at this time entertained by no one. Upon the assembling of this Congress, Peyton Randolph, of Virginia, was chosen the president of it, and Charles Thompson secretary. In all the deliberations of this body each colony stood upon an equal footing with the others, without regard to population, wealth, or the number of delegates sent. All questions were decided by the colonies present, each having one vote only. They urged several measures upon the consideration of their constituents as proper means for obtaining a general redress of grievances, and also prepared and published a declaration of what they considered the indefeasible rights of all the colonies under the British constitution. They adjourned Oct. 26, 1774, with a recommendation to the colonies to meet in Congress again, by deputies, May 10, 1775.

In speaking of the papers issued by this assemblage, Lord Chatham said in the British Parliament that, though he had studied and admired the free states of antiquity, the master-spirits of the world, yet for solidity of reasoning, force of sagacity, and wisdom of conclusion no body of men could stand in preference to this Congress. All this, however, incensed rather than appeased the ministry. On Apr. 1, 1775, they had 3,000 troops in Boston for the purpose of enforcing their iniquitous measures at the point of the bayonet. Hostilities soon ensued. The battles of Concord and Lexington were fought. Engagements also took place at Ticonderoga, Crown Point, and Skenesborough in New York.

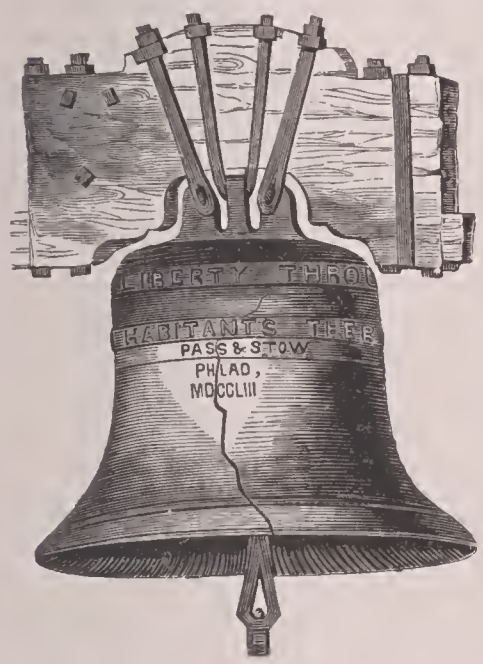
It was in this state of things that the second Congress of the colonies assembled at Philadelphia on May 10, 1775, according to the recommendation of its predecessor. Peyton Randolph, of Virginia, was again chosen president, but soon being called home on urgent business, John Hancock, of Massachusetts, was on May 24 chosen president of the Congress in his stead. The crisis was now becoming not only serious, but alarming. The purpose of Great Britain to reduce the colonies to absolute subjection without any redress of grievances seemed to be evident. The Congress, with firmness and without hesitation, determined to resist force by force. Troops were raised for the purpose. In setting forth the reasons for their action in thus defending themselves and their constituents, they declared that they had "no wish to separate from the mother country, but only to maintain their chartered rights." "In our native land," said they, "and in defense of the freedom which is our birthright, and which we have ever enjoyed till the late violation of it, for the protection of our property, acquired solely by the honest industry of our forefathers and ourselves, against violence actually offered, we have taken up arms. We shall lay them down when hostilities shall cease on the part of the aggressors, and all danger of their being renewed shall be removed, and not before."

On June 14, 1775, at the instance of Massachusetts, George Washington, one of the delegates of Virginia, was unanimously appointed commander-in-chief of all the colonial forces. He was commissioned in the name of the united colonies, the name of each colony present by its deputies being set forth in the commission. This office he accepted on the condition that he should receive no salary except the payment of his actual expenses.

Three days afterward the battle of Bunker Hill was fought. Washington did not reach the vicinity of Boston until July 12, 1775, when he assumed the command of the colonial army assembled there. It was not until the early part of the year 1776 that the public mind throughout the colonies began generally and seriously to consider the question of independence, though a portion of the people of North Carolina had taken this view of the subject almost from the beginning of the troubles. As early as May 20, 1775, their celebrated Mecklenburg convention assembled and announced their famous declaration, severing themselves for ever from all their allegiance to the crown of Great Britain. Though the influence of this act upon the other colonies appears not to have been very great, the historical importance of it was very considerable, as it preceded the general declaration by more than a year, and gave expression to many of the thoughts embodied in the more celebrated document. See MECKLENBURG DECLARATION OF INDEPENDENCE.

In Jan., 1776, Massachusetts instructed her delegates in the Congress of the colonies at Philadelphia to vote for independence. The same thing was done by South Carolina in March, and by Georgia and North Carolina in April. In May, Gen. Washington wrote: "A reconciliation with Great Britain is impossible. . . . When I took command of the army I abhorred the idea of independence; but I am now fully satisfied that nothing else will save us." In the same month Virginia instructed her delegates in Congress to vote for independence. New Hampshire, New Jersey, and Maryland followed early in June. Pennsylvania and New York delayed action, still indulging hopes of an adjustment of the controversy. The general instructions of the colonies to their delegates were to renounce all allegiance to the British crown, and to form a confederation among themselves as independent States. On June 7 Richard Henry Lee, a delegate from Virginia, moved a resolution in Congress that "these united colonies are, and of right ought to be, free and independent States, . . . and that a plan of confederation be prepared and transmitted to the respective colonies for their consideration and approbation." This resolution was adopted on June 11. Two committees were appointed under it—one to prepare a Declaration of Independence and the other to prepare Articles of Union or Confederation. The committee to prepare the Declaration of Independence consisted of Thomas Jefferson, of Virginia, John Adams, of Massachusetts, Benjamin Franklin, of Pennsylvania, Roger Sherman, of Connecticut, and Robert R. Livingston, of New York. They reported on June 28, but action on the report was deferred for some days for the delegates from Pennsylvania and New York to receive their instructions and powers to vote for the Declaration. This celebrated paper was drawn up by Mr. Jefferson, the chairman of the committee, being only slightly modified in some parts, as it now stands, at the suggestion of other members. It came up for final action on July 4, when it received the unanimous vote, not only of all the colonies, but of all their delegates in Congress. It is given in full herewith, with facsimiles of the signatures.

Revised by C. K. ADAMS.



The "Liberty Bell" was first imported from England in 1753. It was cracked at the first ringing after its arrival, and recast in Philadelphia in the same year. Upon the fillets around it were cast (twenty-three years before the Declaration of Independence) the prophetic words, "Proclaim liberty throughout all the land, unto all the inhabitants thereof." After the first reading of the Declaration it was rung for more than two hours, with the firing of cannon and the beating of drums. The bell has been broken for many years, and is to be seen in the hallway of the old State-house, Philadelphia. In 1893 it was taken to Chicago, to be exhibited, with other objects of historic interest, at the Columbian Exposition.

TEXT OF THE DECLARATION.

IN CONGRESS, *July 4, 1776.*

THE UNANIMOUS DECLARATION OF THE THIRTEEN UNITED STATES OF AMERICA.

When, in the course of human events, it becomes necessary for one people to dissolve the political bands which have connected them with another, and to assume, among the powers of the earth, the separate and equal station to which the laws of nature and of nature's God entitle them, a decent respect to the opinions of mankind requires that they should declare the causes which impel them to the separation.

We hold these truths to be self-evident, that all men are created equal; that they are endowed by their Creator with certain unalienable rights; that among these are life, liberty, and the pursuit of happiness. That to secure these rights, governments are instituted among men, deriving their just powers from the consent of the governed; that whenever any form of government becomes destructive of these ends, it is the right of the people to alter or to abolish it, and to institute a new government, laying its foundation on such principles, and organizing its powers in such form, as to them shall seem most likely to effect their safety and happiness. Prudence, indeed, will dictate that governments long established, should not be changed for light and transient causes; and accordingly, all experience hath shown, that mankind are more disposed to suffer, while evils are sufferable, than to right themselves by abolishing the forms to which they are accustomed. But when a long train of abuses and usurpations, pursuing invariably the same object, evinces a design to reduce them under absolute despotism, it is their right, it is their duty, to throw off such government, and to provide new guards for their future security. Such has been the patient sufferance of these Colonies, and such is now the necessity which constrains them to alter their former systems of government. The history of the present King of Great Britain is a history of repeated injuries and usurpations, all having, in direct object, the establishment of an absolute tyranny over these States. To prove this, let facts be submitted to a candid world:

He has refused his assent to laws the most wholesome and necessary for the public good.

He has forbidden his Governors to pass laws of immediate and pressing importance, unless suspended in their operation till his assent should be obtained; and, when so suspended, he has utterly neglected to attend to them.

He has refused to pass other laws for the accommodation of large districts of people, unless those people would relinquish the right of representation in the Legislature; a right inestimable to them, and formidable to tyrants only.

He has called together legislative bodies at places unusual, uncomfortable, and distant from the depository of their public records, for the sole purpose of fatiguing them into compliance with his measures.

He has dissolved representative houses repeatedly, for opposing, with manly firmness, his invasions on the rights of the people.

He has refused, for a long time after such dissolutions, to cause others to be elected; whereby the legislative powers, incapable of annihilation, have returned to the people at large for their exercise; the State remaining, in the meantime, exposed to all the danger of invasion from without, and convulsions within.

He has endeavored to prevent the population of these States; for that purpose, obstructing the laws for the naturalization of foreigners; refusing to pass others to encourage their migration hither, and raising the conditions of new appropriations of lands.

He has obstructed the administration of justice, by refusing his assent to laws for establishing judiciary powers.

He has made judges dependent on his will alone, for the tenure of their offices, and the amount and payment of their salaries.

He has erected a multitude of new offices, and sent hither swarms of officers to harass our people and eat out their substance.

He has kept among us, in times of peace, standing armies, without the consent of our legislature.

He has affected to render the military independent of, and superior to, the civil power.

He has combined, with others, to subject us to a jurisdiction foreign to our constitution, and unacknowledged by our laws; giving his assent to their acts of pretended legislation.

For quartering large bodies of armed troops among us:

For protecting them, by a mock trial, from punishment, for any murders which they should commit on the inhabitants of these States:

For cutting off our trade with all parts of the world:

For imposing taxes on us without our consent:

For depriving us, in many cases, of the benefits of trial by jury:

For transporting us beyond seas to be tried for pretended offenses:

For abolishing the free system of English laws in a neighboring province, establishing therein an arbitrary government, and enlarging its boundaries, so as to render it at once an example and fit instrument for introducing the same absolute rule into these colonies:

For taking away our charters, abolishing our most valuable laws, and altering, fundamentally, the powers of our governments:

For suspending our own legislatures, and declaring themselves invested with power to legislate for us in all cases whatsoever.

He has abdicated government here, by declaring us out of his protection, and waging war against us.

He has plundered our seas, ravaged our coasts, burnt our towns, and destroyed the lives of our people.

He is, at this time, transporting large armies of foreign mercenaries to complete the works of death, desolation, and tyranny, already begun, with circumstances of cruelty and perfidy scarcely paralleled in the most barbarous ages, and totally unworthy the head of a civilized nation.

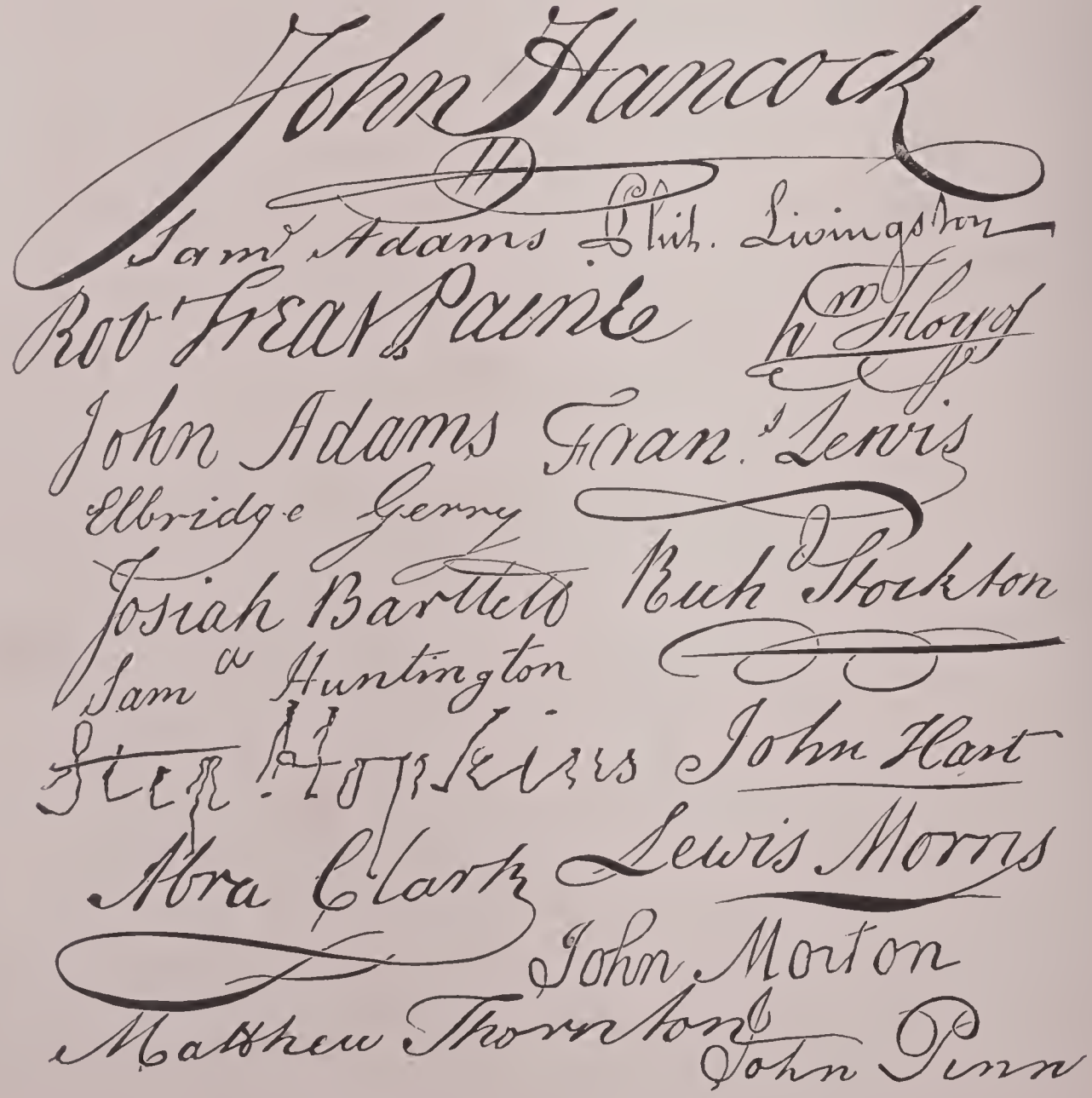
He has constrained our fellow-citizens, taken captive on the high seas, to bear arms against their country, to become the executioners of their friends and brethren, or to fall themselves by their hands.

He has excited domestic insurrections among us, and has endeavored to bring on the inhabitants of our frontiers, the merciless Indian savages, whose known rule of warfare is an undistinguished destruction of all ages, sexes, and conditions.

In every stage of these oppressions, we have petitioned for redress in the most humble terms; our repeated petitions have been answered only by repeated injury. A prince whose character is thus marked by every act which may define a tyrant is unfit to be the ruler of a free people.

Nor have we been wanting in attention to our British brethren. We have warned them, from time to time, of attempts made by their legislature to extend an unwarrantable jurisdiction over us. We have reminded them of the circumstances of our emigration and settlement here. We have appealed to their native justice and magnanimity, and we have conjured them, by the ties of our common kindred, to disavow these usurpations, which would inevitably interrupt our connections and correspondence. They, too, have been deaf to the voice of justice and consanguinity. We must, therefore, acquiesce in the necessity which denounces our separation, and hold them, as we hold the rest of mankind, enemies in war, in peace friends.

We, therefore, the Representatives of the United States of America, in General Congress assembled, appealing to the Supreme Judge of the world for the rectitude of our intentions, do, in the name and by the authority of the good people of these Colonies, solemnly publish and declare, That these United Colonies are, and, of right, ought to be, *free and independent States*; that they are absolved from all allegiance to the British crown, and that all political connection between them and the state of Great Britain is, and ought to be, totally dissolved; and that, as *free and independent States*, they have full power to levy war, conclude peace, contract alliances, establish commerce, and to do all other acts and things which *independent States* may of right do. And, for the support of this Declaration, with a firm reliance on the protection of Divine Providence, we mutually pledge to each other, our lives, our fortunes, and our sacred honor.



Roger Sherman
Wm Whipple Jno Witherspoon
William Ellery Wm Hooper
Oliver Wolcott Robt Morris
Benj Franklin Wm Williams
Wm Paca
Jno Hopkinson Thos Stone
Charles Carroll of Carrollton
Th Jefferson Geo. Taylor
Edward Rutledge Joseph Hewes
Jas Smith Geo Ross
Geo Clymer Thos M Kean
Button Gwinnett Geo Read
James Wilson
Thomas Lynch Junr George Wythe
Samuel Chase
Benjamin Rush Lyman Hall
Richard Henry Lee
Arthur Middleton Thos Nelson jr.
Caesar Rodney Carter Braxton
Benj Harrison Geo Walton
Francis Lightfoot Lee
Thos Heyward Junr.

Declaration of Independence, The Mecklenburg: See MECKLENBURG DECLARATION OF INDEPENDENCE.

Declaration of Indulgence: a proclamation issued by James II., granting religious toleration to Protestant and Roman Catholic Nonconformists, and ordered to be read in all the churches. It was expected to draw the Dissenters to the side of the king's Catholic policy, since they, in common with the members of the king's faith, were benefited by it, but a storm of opposition arose in all quarters; many of the clergy refused to read it, and at last the seven bishops, headed by Archbishop Sancroft, presented the famous petition for the remission of the requirement that it should be read. Their trial followed on the charge of seditious libel, and amid the most intense excitement resulted in their acquittal. The effect of the declaration was to consolidate the opposition and precipitate the revolution of 1688. F. M. COLBY.

Declaration of Paris: the declaration made by the delegates to the Congress of Paris, 1856, in regard to privateering, blockades, etc. The Crimean war was waged on new and milder principles of naval capture. At its outset the allies announced that they intended to waive their undoubted right to seize enemy's goods on a neutral ship not being contraband of war. Nor would they confiscate neutral property not contraband on an enemy's ship. And they declared that it was not their present intention to issue letters of marque. The sentiments which led to these changes survived the war, and animated the delegates to the Congress of Paris in 1856. After settling various questions growing out of the war and its issue, the plenipotentiaries united in the following declaration:

"Considering that maritime law in time of war has long been the subject of deplorable disputes; that the uncertainty of the law and of the duties in such a matter gives rise to differences of opinion between neutrals and belligerents which may occasion serious difficulties, and even conflicts; that it is consequently advantageous to establish a uniform doctrine on so important a point; and that the plenipotentiaries assembled in congress at Paris can not better respond to the intentions by which their governments are animated than by seeking to introduce into international relations fixed principles in this respect—the above-mentioned plenipotentiaries, being duly authorized, have adopted the following solemn declaration:

"1. Privateering is and remains abolished.

"2. The neutral flag covers enemy's goods, with the exception of contraband of war.

"3. Neutral goods, with the exception of contraband of war, are not liable to capture under an enemy's flag.

"4. Blockades, in order to be binding, must be effective—that is to say, maintained by a force sufficient really to prevent access to the coast.

. . . . . .

"The present declaration is not and shall not be binding, except between those powers who have acceded or shall accede to it."

This declaration has since been acceded to by all the important maritime states, except the U. S., Mexico, and Spain. The refusal of the U. S. was based upon its dependence upon privateering to supplement its small standing navy in case of maritime war. But Mr. Marey, Secretary of State, offered in return for the exemption of all innocent private property, even an enemy's, from capture, to give up privateering thus become unnecessary, and to accept the other articles. This "Marcy amendment" was declined.

Thus the case rested until the breaking out of the civil war in the U. S. in 1861. Then Mr. Seward made haste to commit his Government to the declaration. Great Britain and France assented, with the proviso that the accession of the U. S. should not be retrospective, for they had both recognized the belligerency of the South, and its right therefore to issue letters of marque, and could not permit the North to limit those rights by acceding to this declaration, and so preventing privateering by neutral subjects. And yet both countries forbade their citizens to accept letters of marque to cruise against a friendly power, as a matter of policy, and this practical refusal of the offer of the U. S. seemed unfriendly. Upon receiving it, the offer to accede was withdrawn.

As regards the rules of the declaration, all but the first are accepted as a part of international law by the U. S., many of whose treaties forbid privateering as between the contracting parties. The U. S. have not (1893) issued letters of marque for sixty years and more. Fast cruisers are now built to do the same work, and the privateer is not needed. What is needed is the right under rules 2 and 3 of the declaration—to carry the goods of a belligerent on U. S. ships. At present, unless in special cases by treaty, the U. S. have no such right, and could not compete with the parties to the declaration on equal terms. If Great Britain and France were at war French cruisers could seize every cargo of U. S. grain or every bale of U. S. goods afloat under the British flag, while if Great Britain and Russia were at war British ships could capture all Russian goods sailing in U. S. bottoms. Neither the produce nor the carrying trade of the U. S. would be safe. So that by acceding to the Declaration of Paris the U. S. would lose little or nothing and gain a great deal. THEODORE S. WOOLSEY.

Declaration of Rights: a state paper presented to the Prince and Princess of Orange (afterward William III. and Mary II.) at the time the crown was tendered to them (Feb. 13, 1689). The declaration had been drawn up by the Convention-parliament, and complained of the following grievances which England had endured during the reign of James II.: The exercise of the dispensing power, the establishment of illegal ecclesiastical tribunals, unlawful taxation, the unlawful maintenance of the army, interference with the courts and the elections, the levying of excessive bail, the infliction of barbarous punishments, and the refusal to hear petitions. The declaration then asserted the rights which had been thus violated, and claimed various privileges for the nation. The substance of this declaration became the BILL OF RIGHTS (*q. v.*), passed in the second session of the first Parliament under William and Mary.

Declaration of War: the formal announcement by one government of its intention to wage war against another. Formerly this proceeding was usually observed among civilized nations. But since the universal use of the telegraph in political correspondence and for conveying the news of the world, the events leading up to a war are so accurately and widely known that a formal declaration is unnecessary, and this with no design of taking an enemy unawares. It is still customary, however, for each belligerent at the outbreak of war to issue manifestoes (1) to its own subjects, to inform them of the impending change and its risks to their property; and (2) to neutrals, to make known the principles and rules of war which will be enforced. In the U. S. an act of Congress, voting to carry on war, is constructive notice of war to all other states. At the beginning of the civil war in 1861 it was held that when the course of justice was interrupted, and courts in the South were closed, there was a state of civil war in existence without necessity for any farther declaration. In the U. S. the declaration of war is a power exercised by Congress alone. During the age of chivalry a herald made declaration of war at the enemy's court, his tabard on his arm. No offense was taken at his defiance, which was frequently rewarded by gifts of money from the party defied. See INTERNATIONAL LAW.
Revised by T. S. WOOLSEY.

Declension [accommodated to analogy of endings like *dimension*, *extension*, etc., from O. Fr. *declinaison* < Lat. *declinatio* (*-nem*), bending aside, inflection]: in grammar, those modifications of form by which nouns, adjectives, and pronouns express the various relations of case. These modifications vary also according to number and gender. The various cases of nouns serve not only to name the objects of thought, but also to denote the relations which these bear in the sentence to the nucleus of the thought or statement—i. e. the verb. In the so-called inflectional languages, like the Indo-European and Semitic, the modification of form is achieved without disturbing the unity of the word, in the agglutinative, like the Turkish, by the addition of elements which preserve a conscious individuality. Those languages in which the relations of the words are commonly left without formal expression are called the isolating. Such are the Chinese and Siamese.

The Indo-European parent-speech was provided with seven different groups of noun-forms for the conventional expression of the most important relations within the sentence. These are the nominative, accusative, genitive, ablative, dative, locative, and instrumental cases. The vocative, which is merely the interjectional form of the noun, is not strictly to be included among the cases. In form it was either the bare stem of the noun, as in Lat. *serve*, Gr. *πάτερ*, or took the form of the nominative. The nominative case indicated the substantive idea in connection with which the action of the sentence as expressed in the verb gained its

expression and received its psychological shape. In form it consisted in the singular of the stem of the noun often with a heavy final syllable, or was indicated by the sign *-s*; in neuters it was like the accusative; cf. Gr. *πατήρ*, *λόγο-ς*. In the plural its prevailing sign was *-es*, which uniting with the final vowel of the *o-* stems produced *-ōs*; cf. Gr. *πόδες*, Goth. *wulfōs*. The endings Gr. *-οι* and Lat. *ī*, etc., had their origin in the pronominal declension. The accusative denoted that toward which the action of the verb was aimed or to which it was directly applied, or, in general, served as the complement of the verb. Its sign was in the singular *-m*, in the plural (masculine and feminine) *-ns*. The neuter plural used a distinct collective form ending in *-ā* (or *ə*). The genitive expressed a relation between noun and noun or a tangency of the action of the verb to a noun. In the singular its sign was *-os* (*-es*, *-s*) or *-si̯o*, in the plural *-ŏm*. The ablative indicated the source of the action of the verb. In the singular its sign was *-d* (preceded by a lengthened vowel), or it was merged with the genitive; in the plural it was merged with the dative. The dative denoted that which the action concerns. Its sign in the singular was *-ai*, in the plural *-bhios* or *-bhos*. The locative denoted the place or sphere within which the action took place. Its sign in the singular was *-i*, in the plural *-su* or *-si*. The instrumental expressed accompaniment or means, and its sign was in the singular *-a* or *-bhi*, in the plural *-bhis*, *mis*, or *-is* (preceded by a long vowel). The number of these cases was generally reduced in the separate languages. A single case-form often assumed the functions of two or more cases. Thus in Latin the so-called ablative case-form combines the meanings of locative, instrumental, and ablative, and in the Greek the so-called dative includes the meanings of locative, instrumental, and dative, and the genitive the meanings of ablative and genitive. Such confusions or syncretisms were generally due to a confusion of the case-functions in use, rather than to a merging of form. As this confusion increased with the development of the various languages, the use of prepositions to supplement the definition of the syntactical relations steadily increased, so that e. g. in English we possess only bare remnants of three case-forms—the nominative, genitive, and accusative—and express the most of the case-relations by the aid of prepositions. The adverbs, prepositions, and infinitives in the various languages are chiefly made up of petrified case-forms; thus the Lat. *modŏ*, *benĕ*, *malĕ* are instrumentals; *rectē*, *optimē*, *pondō* are ablatives; *partim*, *statim* accusatives. The infinitives Gr. *δόμεναι*, Lat. *sequī* are datives, while *δόμεν* and *regĕre* are probably locatives.

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BENJ. IDE WHEELER.

Declination [from Lat. *declinatio*, bending aside, down, deriv. of *declina're*]: in astronomy, the angular distance of a celestial body from the celestial equator; measured along a great circle passing through the center of the body and the poles of the heavens; or it may be defined to be the arc of a circle of declination passing through the place of the heavenly body, intercepted between that place and the celestial equator. The place of a star in the heavens is determined by means of its right ascension and declination, which correspond to longitude and latitude on the surface of the earth.

Declination of the Magnetic Needle: the deviation of the axis of a magnetic needle (that is, the straight line which joins its poles) from the astronomical meridian. This declination is sometimes toward the W. and sometimes toward the E. From a table of observations made at Paris it appears that since 1580 the declination has varied more than 31°. In 1663 it vanished. From the date of the first observations till 1820 it advanced progressively westward, but since that time it has assumed a retrograde movement toward the E. The declination of the magnetic needle at London in 1865 was 20° 30′. In 1893 it was scarcely perceptible at Cape Hatteras. To the W. of that point it is easterly, and to the E. the variation is westerly. See MAGNETISM and EARTH.

Declinom'eter [mod. malformation from Lat. *declina're*, decline + Gr. *μέτρον*, measure]: an apparatus for measuring the declination of the magnetic needle, or the force of terrestrial magnetism in the plane of the horizon.

Decomposition [from Lat. *de*, from, un- + *compon'ere*, *compositum*, arrange, construct]: in chemistry, the separation of compound substances into their elementary parts. When compounds are resolved into their elements, or when the chemical constitution of substances is altered, they are said to be decomposed; and when in this operation new products are formed, such products are called the results of decomposition. Thus ammonia is the result of the decomposition of certain animal substances; carbureted hydrogen gas is the result of the decomposition of pit-coal, etc. Chemists use the terms simple and compound, or single and double decomposition, to distinguish between the less and more complicated cases. When a compound of two substances is decomposed by the intervention of a third, which is itself simple or which acts as such, the case is one of simple decomposition; water, for instance, is a compound of oxygen and hydrogen. When the metal potassium, which is a simple body, is thrown into it, it is decomposed; the hydrogen is liberated in the form of gas, and the oxygen combines with the potassium to form potassa. See CHEMISTRY.

De Coninck, PIERRE LOUIS JOSEPH: genre-painter; b. at Méteren, Nord, France, Nov. 22, 1828. Pupil of Léon Cogniet; second Prix de Rome 1855; medals, Salons, 1866 and 1868; second-class medal, Paris Exposition, 1889; Legion of Honor 1889. *At the Fountain*, Wolfe Collection, Metropolitan Museum, New York. Studio in Paris. W. A. C.

Deco'rah; city; capital of Winneshiek co., Ia. (for location of county, see map of Iowa, ref. 2–J); on railway, and on the upper Iowa river. It is the seat of a Norwegian Lutheran college and the Decorah Institute; it has manufactories of paper, flour, windmills, wagons, etc., and a considerable publishing industry. Pop. (1880) 2,951; (1890) 2,801; (1900) 3,246. EDITOR OF "REPUBLICAN."

Decorated Style: a term first employed by Rickman to designate that phase of English Gothic architecture which succeeded the Early English about 1285, and gave way in turn to the Perpendicular about seventy-five years later. Less vigorous than the Early English, it is more ornate, especially in its many-ribbed vaulting and rich window traceries. Its structural forms are more slender and elaborate than in the preceding period, and profusely decorated with naturalistic foliage and other carved enrichments. Sharpe, who counts seven instead of three periods in English mediæval architecture, divides this period according to its changing types of traceries into two, the Geometric, from 1285 to 1320, and the Curvilinear, from 1320 to 1360.

A. D. F. HAMLIN.

Decoration Day: in the U. S., the day set apart to the memory of the soldiers and sailors who fell in the civil war of 1861–65. It was originally called Memorial Day, and is observed by processions and orations in honor of the dead, and especially by decorating with flowers the graves of all who fought in any of the wars of the U. S. The day observed at first differed with the various States, but usage has settled on May 30, which has been made a legal holiday in most of the States. This day is said to have been chosen because it was the date of the discharge of the last soldier of the Union army in the civil war.

Decorations: See ORDERS.

Decorative Art: fine art applied to the ornamentation of objects which exist for other purposes than beauty. Thus the hilt of a sword consists of grip, pummel, guard, etc., and needs no ornament, having indeed a certain beauty of its own from the fitness of its parts and the color of the metal, etc.; but if it receives embossing and chasing, or damaskeening, or even an elaboration of form not required by utility, then the fine art employed in beautifying it in these ways is *decorative art*. By extension the term is used for the various fine arts of less developed and less dignified character; thus a statuette carved in wood and painted, or one made of Dresden porcelain, is often spoken of as a work of decorative art, although the statuette serves no purpose except as a work of art; but a life-size statue would not be called a work of decorative art, nor would even a statuette of bronze or ivory be called so except erroneously, and because it may serve to "decorate" a room. So a painting on canvas is not spoken of as decorative art, but one on a porcelain *plaque* is so spoken of, though it serves no purpose but that of a picture. This extension of the term comes from the employment of those materials or those means of ornamentation which are commonly used for decorative art proper. Thus, in the cases just now given, carved and painted wood is so much used for ornamenting useful things, such as

buildings and parts of buildings, furniture, and the like, and porcelain is so much used for unornamental dishes, bowls, and cups, that these materials and the ornamentation generally applied to them give the character of decorative art to anything in which they are used.

The chief of the decorative arts, or the chief manifestation of decorative art, is what we call architecture—that is, the making a work of fine art of a building which, if purely utilitarian and without any application of fine art to it, would be equally useful as a building. But the kind of fine art used in making a building beautiful by means of the proportion of its parts, its generally graceful form, its picturesqueness or its tranquil majesty, its lightness or its ponderous solidity; and also by means of the leafage, the animal or other forms added to it in relief, inlay, etc., is exactly the same as that used in the sword-hilt, cited above. In times when art was great the same man would design a palace and a bronze medallion and a silver flask for priming-powder; moreover, the same man would paint a sacred picture on a church wall and a coat-of-arms above a mantelpiece. Not that much good decorative art was not produced by artists of secondary rank, for undoubtedly the greater number of ornamental weapons and pieces of furniture were made by men who did not make statues or paint frescoes on church walls; but there was no sharp and generally seen distinction; the statuary was the more skillful carver, the religious painter was the painter of bridal chests and armorial shields grown stronger and more skillful, and now generally recognized as a master.

Decorative art may be divided into classes and groups of classes as to the materials employed or as to the articles and objects adorned. Usually a twofold classification is adopted. Thus in a great collection, which has now (1893) been dispersed, the classification was under thirty-six heads for mediæval or later objects alone. Sometimes the material determines the title, as leather-work or ivory-carvings; sometimes the destination of the objects, as arms and armor, or coins, medals and counters, or church goldsmiths' work. To this list of the classes of European objects for a term of eight or nine centuries only would have to be added the lacquers of Oriental art, the lapidaries' work in very hard and costly stones of both Oriental and Western nations, bookbinding, the mosaics of antiquity and the Middle Ages, the architectural inlays of stones, etc., of different colors, the glazed and other pottery used in architecture, the painted vases of the Greeks and their imitators, the painting of architecture in bright colors used by Egyptians, Greeks, and mediæval artists alike, and the whole immense world of architectural sculpture, in all ages and all lands.

The field is vast, therefore. In fact, all the graphic and plastic arts are *decorative* when used for decoration, and they have been so used far more than in any other way. (See Fine Art.) When savages begin to make simple weapons and simple utensils, the disposition to adorn them in some way shows itself almost from the beginning. And this adorning is partly by adding color or sparkle, as by means of pretty bits of shell or stone or bright feathers, to the weapon or the utensil, and partly by carving it, as by cutting rows of notches, sinking circular pits, engraving wavy and curling lines, and the like. But this coloring and carving is also connected in a curious way with the attempt to represent beasts or birds or men. The inlaid bit of shell is often made to look like an eye; the wooden point of a spear is sometimes worked to look like a tongue projecting from a mouth; even the stiff and rectangular patterns made by weaving together coarse fibers of different colors are forced into some semblance of the human figure or of some beast of chase. All this is decorative art, and this is the only art known to primitive people, because they have not begun yet to make pictures or bas-reliefs in our sense. All the artistic power of the primitive people is given in this ornamenting of spears and paddles and tappa matting and plaited grass; but this ornamenting itself involves a constant attempt to represent the living creatures about the artists—that is to say, the things they care the most about.

Now this is very nearly descriptive also of the condition of fine art in a community of the relatively high civilization of the European Middle Ages. In the thirteenth century in France and England there was still the same turning of all the artistic feeling of the time to ornamentation. No bas-reliefs were made except to fill the tympanum over a door or to adorn the back of a small round mirror or the like; no statues or statuettes except to form a part of the architecture of a church porch, or a *châsse* or shrine for the relics of a saint; no picture of men and their deeds was painted except as an acknowledged and, in a sense, necessary part of the decoration of a building or a piece of furniture. All the fine art of such a time is decorative art; and, as a result, the best artistic thought of the time goes into decoration. The wonderful results of this concentration of thought are seen not only in the decorative work of the time, but long afterward. Thus in the fifteenth century in Italy, although pictures and statues were produced which can not be classed as *decorative art*, the decorative art itself was kept up to a very high ideal. This is the result of tradition; the best artists of the Italian Renaissance had little time to think of jewelry and bookbinding, for their time was taken up with still nobler applications of their power; but the demand for high excellence in decorative art, once established, was slow to cease, and therefore there were still very able men ready to take up these arts and pursue them. At last, however, the demand for such excellence did cease; the high standard was lost. It is a very difficult subject of inquiry why the natural and healthy taste for ornamentation gradually disappeared in Europe, until the French Revolution suddenly destroyed it, and left the European world with no beauty of costume, no natural architecture, no humor for ornamenting. The first half of the nineteenth century went by with but little sign of improvement; but in the second half there has appeared to be a self-conscious and deliberate effort to recover the feeling for decorative art and the power over it which the people of earlier times had held naturally as a part of their intellectual equipment. The predominant commercial spirit of the time has been, however, directly opposed to any such recovery, and the changes of fashion, largely caused by the commercial spirit, have prevented continuous and natural development of any style.

Among people of European civilization, toward the close of the nineteenth century, decorative art is commonly looked at from two very different points of view—the collector's and the constructor's or designer's point of view. All portable objects of art, such as vases of porcelain and of bronze, painted dishes, enamels on metal, stuffs and embroideries, and the like have been for fifty years the subjects of a minute and really scientific study and investigation which has resulted in an historical knowledge of them which no other age of the world has ever possessed. In fact, a large part of the new science of archæology is devoted to these smaller works of decorative art. Immense and costly private collections have been formed, and are perhaps richer in the aggregate than the national museums, especially in containing more of the exceptionally fine and very unusual pieces. Enormous prices are given for such pieces; and this is so far fortunate that it has caused the preservation of many valuable things which would otherwise have been destroyed. Collectors, then, will buy ancient works of art, vases, carvings, bronzes, and the like, rather than modern ones, not only because they are generally finer, but also because they are more easily understood and classified. There are handbooks and dictionaries and also more elaborate treatises to which to refer for ancient art, whereas the work of to-day has to be judged upon its merits, and few persons feel themselves competent to do that. To possess a known and classed ancient work of art, described in the books, or of a kind so described, is more than to have a new piece, however fine. This fact is a serious hindrance to the growth of modern decorative art in portable objects, as there is little encouragement to the maker or the dealer. And here again modern commercialism intervenes to hurt modern art. Any increased respect among buyers and students for modern design is prevented by the disappearance of the art-workmen among a crowd of employees in the shop of a large dealer, and the consequent lack of intercourse between the designer and the employer or paymaster. Moreover, in the organization of a large establishment the designers are separated from the workmen who carry out their designs, and the few instances of fine and original work have generally been obtained by deliberately reversing the ordinary commercial methods.

On the other hand, the decorative art of building—that is to say, the architecture—of the nineteenth century is almost wholly a matter of copying from ancient buildings. Not only is the style of design, in the general mass and in detail, closely followed, but the ornamental details themselves are copied very exactly, far more often than composed anew, or with any degree of originality. An immense number of excellent books on ancient architecture were published be-

tween 1850 and 1890, and photographs have been made in abundance, and are to be bought very cheaply. If a panel of a given shape has to be filled with scroll-work, it is easy to find a photograph of a panel of very nearly the same shape, of fine ancient work of any style that allows of such panels at all. It is far easier and more certain and simple to copy this with such slight modifications as the shape calls for, or as considerations of expense may bid, than to strive for any originality at all. As for the general design of a building, that can not well be copied so closely in most cases, for modern requirements are very different from the ancient ones; but ancient styles are so closely followed, now one style and now another, that no opportunity is afforded for sufficient consideration of the proper form and the obviously natural decoration in any new building, and there is none of that freshness of thought and of inspiration which comes from allowing the design to grow naturally out of the necessities of the case. No style of architecture has ever arisen except when all builders were following the same manner of building and the same fashion of decorating. Slowly, for centuries, an old style, which all the builders and artists of the day were using, as a matter of course, has undergone modifications as the result of new requirements and new ideas, until some unusual opportunity has offered and a new style has developed itself rapidly. Never before in history was a time known like the years from 1840 to 1890, when one designer imitates one style, one another, and only a few exceptions exist of men or associations who are trying to design independently and naturally. This state of things has been almost universal in architecture proper throughout all that long period; not quite so general in stained glass, decorative painting, pottery, furniture, and the like, it is the rule even in these. Nor does it appear that there is sign of improvement. See FASHION.

The above attempt having been made to explain the generally admitted deficiency of the modern European nations in the matter of decorative art, it remains to be shown what there has been done during the latter part of the nineteenth century which is more encouraging; and, first, it must be remarked that the workmen who can design, upon whom Oriental and ancient decorative art has generally depended, exist no longer in Europe or America, and that no designing can be got except from artists of special, deliberate, and costly training. Stained glass for windows is the one branch of decorative art most successfully practiced in America, and the most important part of this is produced by half a dozen painters well known as artists of high rank, and who, if they were not engaged in the stained-glass business, would be producing easel pictures which would bring high prices. Modern wall decoration which is of any value consists of fully realized paintings by artists of just such high rank. Modern architectural sculpture not merely copied from old work is of a wholly different character from that of the past; the foliated capital, the frieze of scroll-work, the conventionalized beast or man of ancient work are replaced, in the few modern buildings that are treated with respect enough to have rich and costly sculpture, by statues of complete scientific excellence, set up in niches or between windows. In all these, representative and expressive art of skilled and highly taught artists, and of technical excellence approaching the highest, has replaced the effective decoration of the artisan working according to tradition. So when a modern manufacture of pottery begins to be artistic, it becomes so by means of painting, as of flowers and leaves, so faithfully studied from nature that it differs from similar work on paper chiefly in the limitation of its coloring. A vase will be ornamented by means of a sprig of chrysanthemum or rose seeming to be laid upon the body and neck, and the painter makes this as like the natural sprig as his means and his ability allow. The vase itself will be very simple in form; indeed, it is very curious how little diversified and how simply modeled are all these richly painted modern vases. The naturalistic sprig or bouquet laid upon it is its only decoration beyond a generally graceful form and a pleasant color and texture of surface.

And evidently it is in this way that modern designers ought to proceed. There is the line of least resistance which all ought to follow. The most accomplished European artists are unable to design in meaningless patterns, scrolls, frets, and zigzags, or in conventionalized and formal hints at animal and vegetable forms, as the humble and unknown artisans of Europe once designed, and as those of the East were still designing until a few years ago. They can not produce shawls like the people of Northern India, nor painted plates and vases like the Chinese, nor varnished boxes like the Japanese, nor rugs like the Persians. Not only is Europe incapable of these beautiful arts, but European influence is destroying them rapidly in the lands where they are native. The only chance for any decorative art is to employ the trained painter and sculptor, and to allow to them this innovation, that great simplicity of form and color shall alternate with fully expressed art of representation and expression, no lower kinds of art being possible to us. RUSSELL STURGIS.

De Costa, BENJAMIN FRANKLIN, D. D.: historical writer; b. 1831 at Charlestown, Mass.; graduated at Biblical Institute, Concord, N. H., 1856; settled in New York, as rector of St. John the Evangelist, in 1863, but many years afterward became a Roman Catholic; has been editor of *The Christian Times*, *Episcopalian*, and *Magazine of American History*. His historical works include *Pre-Columbian Discovery of America by the Northmen*; *Sailing Directions of Henry Hudson*; *Verrazano, the Explorer*.

Decree: See the Appendix.

Decrescen'do: in music, a gradual diminishing of sound, the reverse of CRESCENDO (*q. v.*). It is marked thus >, or abbreviated *decres.*

Decre'tal [from Lat. *decre'tum*, decree, thing determined, ptc. of *decer'nere*]: a letter of the pope determining some point in ecclesiastical law. The canon law (*Corpus Juris Canonici*) consists of the following parts: The *Decretum of Gratian* (1139–59); *The Five Books of the Decretals of Gregory IX.* (1234); *The Liber Sextus of the Decretals of Boniface VIII.* (1298); *The Collection of the Constitutions of Clement V.* (1314–17); *The Extravagantes* (additional decretals) *of John XXII.* (1325); *The Extravagantes Communes* (published 1500, authenticated 1580). The above collections enjoy the official recognition of Gregory XIII., July 1, 1580. To them is to be added the subsequent legislation of popes, councils, and Roman congregations. See Laurin, *Introductio in Corpus Juris Canonici* (Freiburg, Baden, 1889). J. J. KEANE.

Decretals, False (otherwise called the PSEUDO-ISIDORIAN CANONS): a collection of papal letters, canons of councils, etc., both genuine and spurious, made in the course of the ninth century by an unknown author, though in the preface of the work they are ascribed to a certain Isidorus Mercator (Peccator, according to some MSS.). There are about a hundred false decretals under the names of the earlier popes from Clement I. (d. about A. D. 100) to Siricius (384–398). Several of the Pseudo-Isidorian documents were current long before the time of Pseudo-Isidor, and must not be laid to his charge (e. g. the Donation of Constantine, the Letter of Pope Sylvester, etc.). Otgar, Archbishop of Mayence, Benedictus the Levite, of the same city, Pascharius Radbert, Agobard of Lyons, and other ecclesiastics of the middle of the ninth century, have been credited with this remarkable compilation of genuine and forged documents. Modern criticism points to-day toward the city of Le Mans in France, and inclines to fix the date about 850 A. D. The aim of this collection was to free the bishops from the oppression of the metropolitans, themselves under the influence of the Carlovingian kings. Some Protestant writers have maintained that the primacy of the popes is based upon the false decretals. Roman Catholic writers, on the contrary, point to the history of Leo the Great, Gregory the Great, and other popes to show that this position was already acknowledged by the Church. It is true that the popes appealed to them, but it is worth remarking that, as a rule, such appeals took place long after the compilation of the decretals, when they had been accepted by the civil and ecclesiastical world. Their easy acceptance is explained by the fact that they contained much that was genuine and timely, and that the forged documents were, roughly speaking, in harmony with the prevalent temper of European society and the ecclesiastico-political ideas of the time. Petrus Comestor in the thirteenth century, Marsilius of Padua in the fourteenth century, and in the fifteenth century Gobelinus Persona, Heinrich Kalteisen, and Cardinal Cusanus (Nicolaus von Cues) doubted their genuineness. The Magdeburg Centuriators pursued the question with more vigor, and since the refutation of Turrianus by Blondel (1628) no serious author maintains the genuineness of the entire collection. The latest and best edition of the text is that of Prof. P. Hinschius, *Decretales Pseudo-Isidorianæ et Capitula Angilramni* (Leipzig, 1863). There is a partial translation in *The Ante-Nicene Fathers*, viii., 601–644. J. J. KEANE.

Decu'rion [Lat. *decu'rio*, head of a *decu'ria*, a body of (originally) ten]: the leader of a *decuria*, or body of ten men, in the Roman cavalry. Three *decuriæ* constituted a *turma*, or body of thirty men, and the name decurio was afterward given to the commander of the larger body. There were also civil officers called decurions who during the republic constituted the executive authority in the Italian municipalities. Under the empire their functions gradually dwindled to those of mere tax-receivers.

Decussation [Lat. *decussa'tio*, deriv. of *decussa're*, to make in form of a cross (X); cf. *decus'sis*, the number ten (X.), a coin valued at ten *asses*; *decem*, ten + *as*, *assis*, unit of value]: in anatomy, a crossing of nervous filaments, so called from a fancied resemblance to the letter X. The innermost fibers of the anterior pyramids and lateral columns of the *medulla oblongata* decussate freely from side to side; so that disease in one side of the brain frequently leads to paralysis of the opposite side of the body. Another decussation occurs between the optic nerves; this is often called the *chiasma*, also from its resemblance to the letter X (the Greek *chi*). The crossing of rays of light, etc., is also called decussation.

Dedham: town and railway center; capital of Norfolk co., Mass. (for location of county, see map of Massachusetts, ref. 5–I); situated on Charles river, 10 miles S. W. of the State-house in Boston. It has a granite court-house, jail, house of correction, a home for fallen women, town-hall, and large woolen mills. In 1872 part of Dedham township was included in the new township of Norwood. Pop. of township (1880) 6,233; (1890) 7,123; (1900) 7,457. Part taken to form Westwood town since 1890.

Dedication [Lat. *dedica'tio*, deriv. of *dedica're*, publish, set forth, formally transfer, dedicate]: a complimentary address to a particular person, prefixed by an author to his work. This custom was in use at a very early period. Horace, Vergil, Cicero, and Lucretius were among those who practiced it. At the period of the revival of letters in Europe few works were published without dedications. Many of these are remarkable for their elegance and purity of style. But the practice became perverted, and many authors of the succeeding generations employed them chiefly with the view of securing the patronage of the great. Dedications were most abused in France under Louis XIV., and in England from 1670 to the accession of George III. Dryden was a great dedicator, and Johnson wrote dedications for money. Corneille got 1,000 louis d'ors for the dedication of *Cinna*. Some of the most beautiful dedications are those prefixed to the different volumes of the *Spectator* by Addison, and in more recent times those with which each canto of Sir Walter Scott's *Marmion* is prefaced.

Dedication, in law: See HEREDITAMENTS, INCORPOREAL.

Dedication, FEAST OF THE: a Jewish feast commemorating the purification of the Temple after its pollution by Antiochus Epiphanes, B. C. 167, and the rebuilding of the altar of burnt-offerings by Judas Maccabæus, after he had driven the Syrians out of Jerusalem, B. C. 164 (cf. 1 Mac. iv. 42–59). It was kept eight days, and very joyously. It is only once referred to in the New Testament (John x. 22). Josephus calls it "Lights" (*Antiq.* xii. 7, § 7). The use of lights was one of the characteristics of the festival. Jesus probably alludes to this when calling himself the "light of the world" (John ix. 5). SAMUEL MACAULEY JACKSON.

Deduction [from Lat. *dedu'cere*, draw from; *de*, from + *du'cere*, draw]: the mental operation which consists in drawing a particular truth from a general principle already known. It is opposed to *induction*, which consists in rising from particular truths to the determination of a general principle. The syllogism is the form of deduction. Before we can deduce a particular truth we must be in possession of the general truth. The mathematical and metaphysical sciences are founded on deduction; the physical sciences rest on INDUCTION (*q. v.*).

Dee: a river of England, 80 miles long; drains parts of Merioneth, Denbigh, Flint, Salop, and Cheshire, and enters the Irish Sea through a tidal estuary 9 miles long and from 3 to 6 miles broad.

Dee, JOHN: astrologer and mathematician whose life affords a curious example of the superstition of the time; b. in London, 1527; graduated at Trinity College, Cambridge, but was forced to leave England on account of the suspicions aroused by his supposed practice of magic; returned in 1551 and received a pension from Edward VI. In Mary's reign he was imprisoned on the charge of attempting the queen's life by means of enchantments, but from Elizabeth he received favorable notice, being consulted by her in the mysteries of magic, and on the occasion of her illness sent to advise with the astrologers and physicians on the Continent. After his return his suspected intimacy with the devil again aroused the wrath of the mob, who wrecked his house and forced him into exile for the second time. Thenceforth he devoted himself to the study and practice of necromancy, and in company with one Kelly, an apothecary, traveled through Europe displaying his powers as a conjuror. Returning to England he was made chancellor of St. Paul's Cathedral (1594), and warden of Manchester College (1595). D. at Mortlake, 1608. F. M. COLBY.

Deed [O. Eng. *dæd*: Germ. *That*; that which is done, accomplished, executed]: a writing on paper or parchment, sealed and delivered. This is its most general signification. In a restricted sense it means an instrument for the conveyance of real estate. According to Lord Coke, it should possess the following requisites: Writing, parchment or paper, a person able to contract, a sufficient name, a person able to be contracted with, a sufficient name, a thing to be contracted for, apt words required by law, sealing, and delivery. Deeds pursue a regular form—containing the premises, *habendum*, *tenendum*, *reddendum*, conditions, warranty, covenants, and conclusion. The premises express the names of the parties, the consideration to be paid for the conveyance, and a description of the property conveyed. This should be minute and accurate. The "habendum" expresses the interest which the grantee is to have, whether it be an estate in fee, for life, or an inferior estate. The "tenendum" refers to the tenure upon which the land is to be held, and is at present of no practical importance. The "condition," "warranty," and "covenants" are not found in all deeds. They may be inserted whenever required to carry out the intention of the parties. When a condition is resorted to, it may be either precedent or subsequent. (See CONDITION.) The covenants vary with the nature of the conveyance. In a conveyance in fee six convenants may be inserted (see COVENANT); and in such case the instrument is called a deed with full covenants. In some instances the single covenant of warranty is introduced, when it is ordinarily termed a warranty deed. In many cases there are no covenants at all, the object of the transaction being only to convey whatever interest the grantor may have. It is a rule of the common law that some words in a conveyance used by a grantor will imply a covenant. This doctrine tends to mislead grantors who are not familiar with the rules of law, and it has been abrogated in some of the U. S.—e. g. New York. There is, however, an important rule that a promise may be implied on the part of the grantee from his acceptance of an instrument containing words purporting to create a personal liability. Thus if there are words to the effect that the grantee assumes the payment of a certain specified mortage, he becomes liable by his acceptance, though he does not execute the instrument. Whether he is liable upon an implied *covenant*, or only upon a promise, is not clear upon the authorities.

A deed may be either an indenture or a deed poll. The leading distinction between these terms is that an indenture purports to be the act of both parties, a deed poll of only one. An indenture commences with the third person, a deed poll with the first. In an indenture the date is found at the beginning of the instrument, in a deed poll at the end. An instrument in the form of a deed poll may be in substance an indenture if there be acts to be done by both parties. Between a strict deed poll and an indenture there is claimed to be an important difference in the construction of doubtful or ambiguous words. In the former these are interpreted against the grantor; the grantee may take the construction most favorable to himself if the words will reasonably bear it. To an indenture the rule has no application, and is not regarded in any case with as much favor in modern law as formerly. In a country like the U. S. where many men not lawyers undertake to draw their own deeds, questions frequently arise as to the effect of omissions or insertions by mistake, or of alterations or erasions. These occur in many instances through mere inexperience, and without any evil intent. In the case of an omission or insertion of a clause by mutual mistake, an application may be made to a court of equity (see EQUITY) to rectify the conveyance and make it what the parties intended it should be. The case of an alteration by one of the parties creates more

difficulty. One of the most perplexing questions presented is whether the fact of an erasure or other alteration raises any presumption that it was made after execution, or whether the opposite view should be taken, that there can be no presumption which would lead to the conclusion that the grantee has committed a wrong. The better view would seem to be that the attendant circumstances should go to a jury, without any presumption either way, and should be passed upon as a matter of fact. A fraudulent alteration would in general vitiate the instrument, though it would not divest a title to land which had already become the property of the grantee. As to all instruments which did not confer an estate, but only created an easement or conferred a right of action, the alteration would be fatal. Conveyances in the U. S. are in general registered or recorded, their execution for that purpose being attended with prescribed formalities. (See REGISTRATION and RECORDING.) The instrument is in general valid between the parties without registration, its object being to protect subsequent purchases or incumbrances. The requisites and validity of a deed of land in any particular State depend upon the law of the place where the land is situated, though the question concerning them be raised in the courts of another State. See also WARRANTY, QUIT CLAIM, COVENANT, and BARGAIN AND SALE.

T. W. DWIGHT.

Deems, CHARLES FORCE, D. D., LL. D.: clergyman; b. in Baltimore, Md., Dec. 4, 1820; graduated at Dickinson College, Carlisle, Pa., 1839; served in the Methodist ministry of the South; was professor in the University of North Carolina 1842–45, and in Randolph-Macon College 1845–46; and president of Greensboro Female College 1850–55. In 1866 he became the pastor of the Church of the Strangers, New York city. He was an abundant and able contributor to the *Southern Methodist Quarterly Review*, and was the author of a volume of sermons; a *Life of Dr. Adam Clarke* (New York, 1840); *Devotional Melodies* (Raleigh, 1842); *Home Altar* (New York, 1850); *What Now?* (1853); *Weights and Wings* (1872); *Twelve College Sermons* (Philadelphia, 1844); *A Scotch Verdict in re Evolution* (1886); *The Light of the Nations* (1868); *The Gospel of Common Sense as Contained in the Canonical Epistle of James* (1889); *Chips and Chunks for Every Fireside; Wit, Wisdom, and Pathos* (1890); *The Gospel of Spiritual Insight; Studies in the Gospel of John* (1891); a volume of poems entitled *Triumphs of Peace* (New York, 1840). He was president of the American Institute of Christian Philosophy from 1881, and editor of *Christian Thought* from 1883. D. Nov. 18, 1893.

Revised by J. F. HURST.

Deemsters, or **Dempsters**: the two chief judges in the Isle of Man, one of whom presides over the northern division of the island, the other over the southern. Formerly in Scotland a *dempster* or *doomster* was an officer, connected with the high court of justiciary, who pronounced sentence on condemned persons.

Deep Bottom: a point on the north side of James river; in Henrico co., Va.; about 12 miles by land and 20 miles by water below Richmond; opposite the peninsula of Jones's Neck, and between Three and Four Mile creeks, and near the battle-ground of Malvern Hill; an important strategic point during the civil war, 1861–65. It was occupied by part of the troops of Gen. B. F. Butler, June 20, 1864, and a pontoon bridge was thrown across the river. Several important actions were fought near Deep Bottom during Aug. and Sept., 1864, the general result being favorable to the Union forces.

Deep River (Indian, *Sapponah*): a river of North Carolina; flows southeastward through Randolph County, and nearly eastward through Chatham County, until it enters the Cape Fear river at Haywood. Coal abounds on its banks. Length, estimated at 120 miles.

Deep-sea Exploration: the limits of the region known as the "deep sea" have been differently defined at different periods of its exploration. To navigators for over a century the 100-fathom lead-line for sounding has been known as the "deep-sea lead," and the general understanding of the term "deep sea" has been that portion of the sea having a depth of 600 feet or more. Knowledge of thalassography has progressed to a point where a more rational subdivision of oceanic depths has taken the place of arbitrary selection, and at present they are divided and designated as follows: 1. The region to which light can penetrate and, therefore, that in which marine algæ can grow, and animals, subsisting only on marine plants, can live; this extends from the shore seaward to a varying depth in different regions, being dependent on the translucency of the water and the average angle of the sun's rays, but in a rough way the 100-fathom depth corresponds to its extreme seaward margin. This area is known as the littoral region. 2. From the seaward edge of the littoral region the sea-bottom slopes more or less directly to the floor of the ocean, which is found, on an average, at a depth of 2,500 fathoms, where it extends in a gently undulated or level plain over vast areas. The latter is known as the benthal or abyssal region, while the intermediate area, chiefly on the continental slopes between the littoral and abyssal areas, has been named the archibenthal region. The region comprised under the name "deep sea" includes the abyssal and archibenthal areas.

Methods of Investigation.—The exploration of the deep sea includes the collection of facts relative to its depth (see BATHOMETER); the nature of the bottom; the temperature, constitution, specific gravity, and motion of the water; the nature and distribution of the organisms which inhabit it. This exploration has grown from small beginnings, represented by the line of the deep-sea fisherman, which in the middle of the eighteenth century brought up the coralline *Umbellularia* from a depth of 234 fathoms in the Arctic Sea, to a science which employs a great variety of complicated and delicate apparatus, and enlists the most ambitious efforts of the physicist, the chemist, the mechanician, electrician, and biologist. Work was first done on the investigation of the depth of the sea. A weighted line was let down into the sea, and the amount run out determined by tags previously attached to the line at measured distances. This method has been in use by all navigators from an unknown antiquity. In shallow water it is of reasonable accuracy, but for sounding the abysses it is an extremely imperfect method. Friction on the line required for great depths delays the arrival of the weight at the bottom, and renders its recovery slow and difficult; surface and submarine currents carry it out of the vertical, so that it does not measure the actual depth truly; and the storage of immense quantities of rapidly deteriorating line offers a serious problem in the case of a vessel engaged in extended sounding work. To overcome the friction of the line against the water extremely heavy weights were first employed. Capt. Sir James Clark Ross in 1840, off the west coast of Africa, by employing a small line with a weight of some 300 lb., obtained a sounding at the depth of 2,677 fathoms, which was determined by the sudden change in the rate of running out of the line when the weight struck the bottom. This appears to be the first recorded attempt at abyssal sounding which met with success in approximating to the real depth, though Sir John Ross as early as 1818 sounded in Baffin's Bay in 800 to 1,000 fathoms, and even brought up a large *Astrophyton*, or basket-starfish, on the line. The U. S. exploring expedition under Wilkes, which sailed in 1838, was supplied with copper wire for sounding purposes, which, however, proved too weak for successful use. In 1849 Capt. Barnett, R. N., attempted to use an iron wire which broke at 2,000 fathoms; and later in the same year Lieut. J. Walsh, U. S. navy, tried steel wire, which also failed from imperfect splicing. The next step was due to J. M. Brooke, U. S. navy, who invented in 1854 a detaching apparatus by which the weight was thrown off, and only the line with a small sample of the bottom remained to be hauled in. This method in principle is now in general use.

The employment of wire having seemed impracticable, the attention of those interested was directed to the improvement of hempen line, various forms of collectors for bringing up specimens of the bottom, and other accessories. All the surveying of the ocean-bed for submarine telegraph cables, which gave a great impetus to deep-sea exploration, was done with hempen line, and in the important series of voyages (1869–73) carried on by the British Government for this purpose, culminating in the voyage of the Challenger, hempen line alone was made use of for sounding.

In 1872 Sir William Thomson invented a machine for using steel piano-wire for sounding purposes. In this the wire furnished with a heavy weight was paid out directly from a reel, on which, by means of an accessory rim, a friction-line checked by a balance was so applied as to make the friction balance the weight of wire run out. On striking the bottom the reel ceases to revolve, and the number of revolutions multiplied by the circumference of the reel gives the length of wire delivered and the depth of the sounding. The introduction of this invention has revolutionized deep-

sea sounding. Owing to some errors of construction, the reel did not work perfectly at first. To Capt. George E. Belknap, U. S. navy, during the voyage of the U. S. Tuscarora in the North Pacific in 1873, is due the demonstration of the practicability of Sir William Thomson's machine when properly constructed; and to Com. C. D. Sigsbee, U. S. navy, the application to it of elastic appliances called "accumulators," which rendered it possible to use steam in reeling in the line, thus perfecting the modern method of deep-sea sounding.

Numerous appliances for obtaining specimens of the bottom have been invented, beginning with the spoon-like tongs of Sir John Ross and including the "Stellwagen cup," the "Belknap cylinder," a modification of Brooks's apparatus, the "Hydra" and "Bulldog" machines, etc., the essential principle of which is a receptacle closing after striking the bottom. The determination of deep-sea water-temperatures was attempted by Ellis about 1750, who brought up water from a depth of 900 fathoms and tested it at the surface. Later attempts made by sending self-registering thermometers down on the line gave erroneous results, due to the influence of pressure on the thermometer bulb, causing an excessive extension of the fluid in the tube. To avoid this difficulty a form of thermometer was suggested by Prof. Miller and constructed by Casella, which consists of a U-shaped tube forming a maximum and minimum thermometer, in which the large bulb is protected by an outer bulb nearly filled with alcohol, space being left for the compression of the outer bulb by the pressure it must encounter. An objection to this form of instrument is that it registers only the minimum or maximum of the entire column of water through which it passes. To obviate this defect another form of instrument, made by Negretti & Zambra, is commonly used. This holds the thermometer in a reversed position until the line begins to be hauled in, when it is released; by an ingenious arrangement the column of mercury above the bulb is then separated from the supply in the bulb and kept apart from it, so that the height of the column at the lowest depth reached may be determined when the thermometer is drawn up. Another means of continuously registering the temperatures on deck during the passage of the instrument through the water has been invented by Sir William Siemens, on the principle that the electrical resistance of a conductor varies with the temperature. This consists of an insulated coil attached to a cable and lowered with the sounding-line, and connected so as to form one arm of a Wheatstone bridge. The corresponding arm of the bridge is formed by a second exactly similar coil, immersed in a copper vessel filled with water, which is heated or cooled until the bridge is balanced. The temperature of the water in the vessel then corresponds to the temperature of the coil. This instrument under favorable circumstances has given excellent results, but owing to the extreme care needed in its use is not likely to supersede the simpler thermometers above mentioned.

For securing samples of water for analysis and specific gravity determinations various forms of "water-bottles" have been devised by Wille, Sigsbee, and other investigators, on the principle of a metallic receptacle capable of sealing itself automatically at a given depth.

Instruments for determining the direction and force of submarine currents have been devised by several investigators, and usually depend upon the principle of the screw-propeller and the differential motion of surface floats.

The abyssal fauna have been explored mainly by means of the dredge, the beam-trawl, and the "tangles," which are simply large "swabs" made of hempen line picked out into twine. On the fibers of the tangles spiny or rough organisms adhere in great numbers, in places where the roughness of the bottom would render dredging impracticable. The dredge is a slightly modified form of the Stimpson dredge used in shallow water, and the beam-trawl is like that of the fishermen, except that it is double, so that whichever side falls on the bottom it will work effectively. In deep-sea work the handling and hauling of both dredge and trawl are done with steel wire rope by steam-power. For searching the region intermediate between the bottom and the surface various forms of nets or traps have been invented which can be sent down closed, opened when at a certain depth, and closed again before being hauled up, so as to investigate only the stratum at a particular depth desired.

Progress of Exploration.—Excluding isolated experiments or inconclusive instances of the capture of living animals from the abysses, the first systematic exploration of the deep sea was carried on by the Norwegians, led by Prof. O. Sars, in the archibenthal region of the north of Europe. But owing to the fact that the deep-water and shore faunas of Norway are in most respects very similar, and for other reasons, the bearing of these researches was not appreciated, and the old notion entertained by Forbes and other eminent naturalists that the dark, cold oceanic abysses are devoid of organic life except stragglers from the surface, though contested by Keferstein, Lovèn, Sars, Torell, Wallich, Ehrenberg, Alphonse, Milne-Edwards, and others, still held general sway. In 1867, however, the U. S. Coast Survey officers, Pourtalès and Mitchell, began systematic explorations in the Straits of Florida, reaching a depth of 850 fathoms. The animals captured were so profuse in quantity, so interesting, novel, and peculiar in character that the active interest of naturalists of all nations was aroused, and exploration began in various quarters. This work has been carried on more or less continuously ever since. The most important researches of the English are the voyages of the Lightning, Porcupine, Shearwater, and Valorous, by which the Mediterranean and North Atlantic regions were explored under the direction of Wyville Thomson, Carpenter, and Gwyn Jeffreys, 1868–72, and the world-renowned voyage of the Challenger under Nares and Thomson, 1873–76, during which all parts of the ocean were visited and observations made at 360 stations. France, with the Travailleur, 1880–81, and the Talisman, 1883, explored the eastern North Atlantic and part of the Mediterranean. Norway continued her work in the boreal Atlantic in the Voringen, 1876–78, and Italy explored the abysses of the Mediterranean in the Washington. In the U. S. work has been more continuous than elsewhere. The U. S. Coast Survey work of 1867 was continued in 1868 and 1869 in the Bibb, while in the Blake, by the co-operation of Agassiz, Sigsbee, and Bartlett, 1877–80, most important results were obtained. The U. S. Fish Commission Albatross and Fishhawk have been more or less continuously engaged since 1872 in work on both shores of both Americas, under the direction of Baird and his successors; and the navy, as represented by Belknap, Tanner, and others above mentioned, has borne a most important part in the work in both oceans.

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W. H. Dall.

Deep-sea Sounding: See Deep-sea Exploration.

Deer [O. Eng. *dēor*: Germ. *Thier*: Goth. *dius*, wild animal; not connected with Gr. θήρ, Lat. *fera*, but probably derived from an I.-E. root *dhus-*, breathe; cf. Lat. *animal*]: the common name for the various members of the family Cervidæ (*q. v.*), a group of ruminating mammals characterized by the presence in the males of solid bony horns or antlers, which are shed and renewed annually. Antlers start as soft excrescences on the forehead, grow rapidly, and attain their full size in about three months. In the early stages they are spongy, permeated by blood-vessels, covered with short hair, and are said to be in the velvet. Having attained their growth, the circulation of blood stops, the antlers harden, and the skin is rubbed off against trees. The first antlers of the young deer make their appearance in the second year as short spikes, and become branched in the third or fourth year; but while the number of branches increases with age up to a certain point, they afford no certain indication of the age of the animal. The antlers are carried for four months or so, and are then broken off or fall off near the skull, just below the "burr." Antlers are sometimes borne by the females, as in the reindeer, and are absent in the males of the musk deer. According to Forsyth, antlers are not shed annually in the warmer parts of Asia. The teeth and stomach of deer are of the usual ruminant type; the feet have two main hoofs, and almost always a small hoof on each side of these. A gall bladder is absent, except in the musk deer. Deer are found in North and South America, Europe, and Asia, this last region, with its large outlying islands, containing the greatest number of species. No deer occur in Australia or Madagascar, and none in Africa S. of the Sahara, while the two species found in Northeastern Africa, the fallow deer and stag, are stragglers from the European fauna.

The common deer of the U. S. is the Virginia deer (*Cariacus virginianus*), known in the West as the white-tailed

deer. It is found throughout the U. S., in Northern Mexico, and in parts of Canada and British Columbia. The more northern specimens are much the largest and most powerful, examples from warm southern localities being quite small. The mule deer (*Cariacus macrotis*), readily distinguished from the preceding by its greater size, black-tipped tail, large ears, absence of brow antlers, and forking of the hinder branch, ranges from Minnesota to the Pacific, and from the latitude of Cape St. Lucas to British Columbia. The black-tailed deer, a closely related but smaller species, is confined to the Pacific coast of the U. S. and British Columbia westward of the Sierra Nevadas.

The Mexican deer (*Cariacus mexicanus*) extends from New Mexico southward, and several small deer of the genus *Coassus*, distinguished by small, spike-like antlers, sloping backward, are found in Mexico and the northern part of South America. Several other species occur in South America, S. of the Amazon or on the western slope of the Andes, which have rather simply forked, erect antlers. The largest and finest is the swamp deer (*Blastocerus paludosus*), with very stout, rough, sharp-pointed antlers. See Axis, Caribou, Elk, Fallow Deer, Moose, Muntjak, Reindeer, Roebuck, Stag, and Wapiti. F. A. Lucas.

Deerfield: town; on railway; Franklin co., Mass. (for location of county, see map of Massachusetts, ref. 2–E); on the west bank of the Connecticut river at its junction with Deerfield river; 33 miles N. of Springfield. The township, which contains the important manufacturing village of South Deerfield, was the scene of several contests with the Indians in colonial times. Among these may be mentioned the "Bloody Brook massacre" (1675), and the burning of the village by the French and Indians under De Rouville (1703). Old Deerfield has a beautiful soldiers' monument, and there is at South Deerfield a marble monument commemorative of the Bloody Brook disaster. Deerfield has an academy, and two high schools. Pop. of township (1890) 2,910; (1900) 1,969. Part annexed to Greenfield since 1890.

Deer-grass: popular name of plants of the genus *Rhexia* and family *Melastomaceæ*. Nine species are natives of the U. S. They have brilliant rosy-purple flowers.

Deer Lodge: former cap. of Deer Lodge co., Mon. (for location of county, see map of Montana, ref. 6–E); on Montana and Union Railway, and on Deer Lodge river in Deer Lodge valley; 50 miles W. of Helena. It has a college, St. Mary's Female Academy, public school, churches of five denominations, a hospital (in charge of the Sisters of Mercy), and a State penitentiary. Pop. (1880) 941; (1890) 1,463; (1900) 1,324. Editor of "New Northwest."

Deer-mouse, or Jumping Mouse: a small mouse (*Zapus hudsonius*) belonging to the family *Dipodidæ*. The body is about 4 inches long, the tail somewhat more, and the hind legs are much longer than the fore; the color is yellowish above, white below. This little mouse is very active in its movements, clearing as much as 10 feet at a bound. It is quite generally distributed throughout the woodlands of North America N. of Mexico, although in southern localities it occurs only on elevated ground.

Deer-mouse is also applied to several mice of the genus *Hesperomys* and family *Muridæ*. The best-known species is the white-footed mouse (*Hesperomys leucopus*), which is widely distributed in North America. This mouse is under 4 inches in length, the tail shorter than the body. The color is grayish or yellowish brown above, white below, the feet also white. F. A. Lucas.

De Facto: a Latin legal phrase signifying in fact, in reality; used to denote the facts as they actually exist, in distinction from *de jure*, which is used to denote the legal rights of the parties in question. The person who usurps a throne to which he has no title is a king *de facto*, and the legitimate claimant is king *de jure*, or of right. An officer *de facto* of a corporation is one who, under an appointment or election which is invalid, assumes to act as an officer of the corporation under such circumstances that his acts are binding upon the corporation with respect to the rights of third persons who dealt with him *bona fide*. A public officer *de facto* is one who performs the duties of an office with an apparent right and under claim and color of appointment to such office or under such circumstances as to justify the presumption that he has a right to exercise its duties, but without being actually qualified by law so to do. The official acts of a public officer *de facto* upon principles of policy and justice are held to be valid so far as they affect the rights of the public or of third persons, and his right to exercise the powers of such office can not be investigated in a collateral proceeding. F. Sturges Allen.

Defamation: See Libel.

Default': in law, in a general sense, a failure in the performance of one's legal obligations, as in the case of a breach of contract; the omission of any act which a party ought to perform in order to entitle himself to a legal remedy. Such is, for example, non-appearance in court on a day assigned. If a plaintiff in an action make default, he is non-suited; if a defendant, judgment by default is passed against him. Judgment by default is not necessarily final.
Revised by F. Sturges Allen.

Defaux, de-fō', Alexandre: landscape-painter; b. in Paris, Sept. 27, 1826. Pupil of Corot: second-class medal, Salon, 1875; Legion of Honor 1881. His pictures are soundly painted and he is a clever technician. *Morning at Château Laudon* and *Harbor of Pont-Aven* are in the Luxembourg Gallery, Paris. Studio in Paris. W. A. C.

Defeasance: in law, a collateral deed accompanying another and containing conditions on the performance of which the estate or interest created by such other deed may be defeated and determined. In the case of conveyances of frecholds the defeasance must be made at the same time as the deed to which it relates, and form a part of the same transaction. In the case of chattels or executory interests or of a bond, recognizance or warrant of attorney, it may be made then, or at any time after the execution of the principal deed. F. Sturges Allen.

Defendant [Fr. *défendeur*]: in law, the party against whom a claim is made in an action or suit. In actions *ex contractu* the person who either expressly or implicitly made the contract should be made the defendant; in actions *ex delicto*, the person who either actually committed the injury or aided in committing it.
Revised by F. Sturges Allen.

Deffand, Marie de Vichy-Chamrond, Marquise du: French literary woman; b. in 1697; married in 1718 to the Marquis du Deffand, but soon separated from him. She was beautiful, witty, accomplished, a skeptic and an egotist. Her house in Paris was frequented by many eminent authors and statesmen. She corresponded with Voltaire, Horace Walpole, and D'Alembert, and wrote letters which are commended for style. D. Sept. 23, 1780.

Defiance: city and railway center; capital of Defiance co., O. (for location of county, see map of Ohio, ref. 2–C); on the Maumee river at the mouth of the Auglaize, and on Miami and Erie Canal; 50 miles W. S. W. of Toledo. It is a manufacturing town. Pop. (1880) 5,907; (1890) 7,694; (1900) 7,579. Editor of "Republican and Express."

Deficient Number: in arithmetic, a number which exceeds the sum of its aliquot parts. Thus 8 is a deficient number, since the sum of its aliquot parts, 1, 2, 4, amounts to only 7.

Definite Proportionals, in chemistry: See Chemistry.

Deflection [from Lat. *deflec'tere*; *de*, off + *flec'tere*, bend]: in architecture and engineering, the bending or depression of a horizontal beam caused by its own weight or that extraneously imposed upon it; also the amount of such deviation from its original form. According to Coulomb, (*a*) deflection is in direct proportion to the weight causing it; (*b*) the weight required to produce a given deflection is proportional to the width of the beam and to the cube of its depth, but (*c*) it is inversely proportional to the cube of the length of the beam. Revised by A. D. F. Hamlin.

De Foe, Daniel: English writer; b. in London in 1661; was a son of James Foe, a butcher and Nonconformist. He was educated at a Dissenter's academy and intended to become a minister, but went into business about 1685, and in that year joined the rebellion of the Duke of Monmouth, after whose defeat he returned to business life in the subordinate position of a secretary and accountant. He produced in 1701 *The True-born Englishman*, a satirical poem designed to vindicate King William III., which was very successful. He wrote an ironical pamphlet entitled *The Shortest Way with Dissenters* (1703), for which the House of Commons punished him with the pillory, a fine, and imprisonment; from 1704 till 1713 he conducted a newspaper called *The Review*. He advocated the principles of the Whigs and Dissenters in several political works. In 1706 the ministers employed him as one of the staff of commis-

sioners sent to Scotland to promote the union of the two countries. He published a *History of the Union* (1709). In 1713 he was again fined and imprisoned for one of his political writings. His most popular work is *The Adventures of Robin Crusoe* (1719). He wrote, besides numerous other works, *Memoirs of a Cavalier* and *Captain Singleton* (both in 1720); *The Fortunes and Misfortunes of Moll Flanders*, *The Journal of the Plague Year*, and the *History of Colonel Jack* (all in 1722); *Roxana, or the Fortunate Mistress* (1724), all of which produce a vivid impression of reality. He was a pithy and vigorous writer, distinguished for his versatility of mind and fertility of invention. D. at Moorfields, Apr. 26, 1731. See W. Hazlitt, *Memoirs of De Foe* (1843); Sir Walter Scott, *Life of De Foe*, prefixed to De Foe's works; William Lee, *Life of Daniel Defoe* (3 vols., 1869).

De Forest, John William, A. M.: author; b. in Seymour, Conn., Mar. 31, 1826; served in the civil war 1861–65; was breveted major; made New Haven, Conn., his home; author of *The History of the Indians of Connecticut* (Hartford, 1853); *Oriental Acquaintance* (New York, 1856); *European Acquaintance* (1858); and a number of novels, including *Miss Ravenel's Conversion* (New York, 1867) and *The Oddest of Courtships* (New York, 1881).

Defregger, de-freg'er, Franz, von: genre-painter; b. at Stronach, Tyrol, Apr. 30, 1835; pupil of Munich Academy and of Piloty; third-class medal, Paris Exposition, 1878; member Munich, Vienna, and Berlin Academies. *Return of the Victors* (1876), National Gallery, Berlin; *The Smith of Kochel* (1881), New Pinakothek, Munich. Studio in Munich. W. A. C.

De Freycinet, Charles Louis de Saulces: See Freycinet, Charles Louis de Saulces de.

De Funiak Springs: town; on railway; capital of Walton co., Fla. (for location of county, see map of Florida, ref. 1–D). It is the seat of the State Normal School. Lumber, cotton, wool, rice, and cane are the principal products. Pop. (1890) 672; (1900) 1,661.

De Garmo, Charles: See the Appendix.

Degeneration: a term applied by Dohrn to those cases of Evolution (*q. v.*) where the line of descent takes apparently a backward direction. In most cases which progress far enough to come to our notice the line is from the simple to the complex; the adult is more differentiated than the embryo, the offspring higher than the ancestor. It, however, happens that frequently there is variation in the opposite direction, and then, by favorable circumstances, these retrograde modifications are accumulated in successive generations to such an extent that the degeneration is evident.

As stated in the article Evolution, one of the ascertained laws of the modern theory of descent is, the development of the individual (*ontogeny*) is a recapitulation of the development of the race (*phylogeny*). In other words, if we know the life-history of any animal, we have in it an outline of its ancestry. Thus the gill-slits of the human embryo are a record of a fish-like ancestor; the three-chambered heart of a reptilian forefather. These are instances of an advancing evolution.

On the other hand, we find in many sedentary and especially in parasitic animals cases which are different. Thus in the Tunicata (*q. v.*) the development is progressive until the result is a free-swimming tadpole-like larva with a cartilaginous rod (notochord) between nervous system and alimentary canal, and paired gill-slits in the throat in the same manner as in the young (tadpole) of the common frog. Then the larva settles down, becomes attached and loses its tail and notochord, and becomes twisted into a loop while the gills become converted into a sieve-like sac. The result is an animal totally unlike the early promise of the embryo, but rather one the vertebrate affinities of which would never be suspected from the adult, but which was formerly classed with the mollusca. Interpreting the facts of development, we say that the tunicates have degenerated from a tadpole-like ancestor with many of the characteristics of the true vertebrates. Another example is furnished by the parasitic Entomostraca (*q. v.*), where the larva is a regular nauplius like that of the more regular Crustacea. This soon becomes attached to some other animal, and, needing no longer to struggle for existence, it gradually degenerates into a worm-like organism scarcely more than an apparatus for obtaining food, provided with the means of reproducing its kind. The nauplius stage (see Crustacea) is a record of a normal crustacean ancestor; the adult is a degenerate descendant. The phenomenon also occurs in the root barnacles. See Cirripedia.

Degeneration is to be regarded as the result of removal from the conditions normal to the group and exposure to those entirely different. Thus in the parasitic Crustacea referred to locomotion is no longer necessary, so the legs are lost, while the mouth changes from a chewing organ into one adapted to sucking the mucus or the body fluids of some fish. J. S. Kingsley.

Degeneration (in plants): In the evolution of the vegeable kingdom as it exists to-day there have been modifications in many directions. While the general direction of evolution has apparently been from the lower and simpler to the higher and more complex, there have been many cases of degeneration from higher forms. If we represent the vegetable kingdom by a many-branched tree, in which the branches and branchlets generally grow upward, we must also show some branches and branchlets in which the direction is distinctly downward. Degeneration is most frequently associated with a dependent habit, as in parasites and saprophytes, in which the vegetative organs of the plant-body have suffered atrophy. Thus in the dodder (*Cuscuta*) the leaves are mere colorless bracts of no value, while the stems, no longer called upon to support large leaves, are weak and brittle. Could we restore to this degenerate plant its lost leaves and original vegetative vigor, we should have something very much like a morning-glory. In *Aphyllon*, now nearly as leafless as the dodder, we have a degenerated figwort (*Scrophulariaceæ*), the floral organs being little changed, while the vegetative parts are greatly reduced. Likewise *Monotropa* is a degenerated rhododendron-like plant (*Ericaceæ*), and the coral-root (*Corallorhiza*) a degenerated orchid. The "fungi" afford the more notable examples of degeneration through parasitism and saprophytism. The black moulds (*Mucoraceæ*), the water moulds (*Saprolegniaceæ*), and the downy mildews (*Peronosporaceæ*) are clearly modified, and somewhat degraded pond-scums (*Zygnemaceæ*) and green felts (*Vaucheriaceæ*), and the powdery mildews (*Erysipheæ*) are probably referable to *Coleochæte* (a genus of semi-parasitic fresh-water algæ). In all these cases we observe that the reproductive parts of the plant-body as compared with the vegetative parts are proportionately larger and more prominent than in the green plants to which they are allied. This has doubtless been carried much further in the cup-fungi (*Discomyceteæ*), the puff-balls and toad-stools, in which the reproductive structure is so large as to be commonly mistaken for the plant-body.

Degeneration is, however, not confined to the vegetative organs of plants. In many fungi the sexual organs have become abortive (as in *Erysipheæ*), and in certain great groups (*Hymenomyceteæ* and *Gasteromyceteæ*) it is the opinion of eminent botanists that they have entirely disappeared. In the flowering plants many families show more or less degeneration in their floral organs. In this way most of the so-called "Apetalæ" have probably been derived. The willows, oaks, walnuts, spurges, elms, etc., have attained their present simplicity of floral structure by modifications essentially of the nature of degeneration. So, too, the sedges and grasses are to be regarded as simplified from the Alisma-like monocotyledonous type of floral structure.

Charles E. Bessey.

Deger, dā'ger, Ernst: historical painter; b. at Bockenem, Hanover, Apr. 15, 1809. Pupil of Berlin and Düsseldorf Academies; member Berlin and Munich Academies; decorated the chapel of Stolzenfels Castle near Coblentz. D. at Düsseldorf, Jan. 27, 1885. W. A. C.

De Giers, Nicholas Carlovitch: Russian statesman; b. May 9 (O. S.), 1820; educated at the Imperial Lyceum of Czarskoe Selo; entered the Asiatic Department of Foreign Affairs at the age of eighteen; ambassador to Persia 1863–69; at Berne 1869–72; at Stockholm 1872; became adjunct to the Minister of Foreign Affairs and director of the Asiatic Department, Dec., 1875; several times had charge of the Ministry of Foreign Affairs in the absence or illness of Gortchakoff, whom he succeeded as Minister of Foreign Affairs in Apr., 1882; especially prominent in his policy in connection with the conflict between Russia and Great Britain in Asia. D. Jan. 26, 1895. C. H. Thurber.

De Goeje, de-khoo-ye, Michael Jan: a Dutch Arabist; b. at Dronryp, Aug. 13, 1836, and trained by the eminent Arabist Dozy. He is Professor of Arabic in the University of Ley-

den, editor of the new edition of *Tabari*, and of other texts, and author of many dissertations on Arabic subjects.

C. H. Toy.

Degree [O. Fr. *degre*; Lat. *de + gradus*, step, grade]: one of a series of progressive steps; also one of the unitary divisions of a scale of measurement.

Degree in Algebra: the magnitude of the greatest sum that can be formed by adding together the exponents of the factents or variables which occur in any single term of an equation or expression. The terms *degree* and *order* are frequently used synonymously in algebra, but have distinct meanings when applied to differential equations.

Degree in Trigonometry: a unit of measurement for arcs of circles and for angles subtended by them; the 360th part of the circumference of a circle, or the 90th part of a right angle. A degree is subdivided into sixty minutes, and each minute into sixty seconds. The notation employed for an angle of six degrees fifty-two minutes and sixteen seconds is 6° 52′ 16″. Thus there are 21,600 minutes and 1,296,000 seconds in the entire circle.

A division of the quadrant into 100 parts was proposed by the authors of the metric system at the time of the French Revolution, and is sometimes used. These parts are sometimes called grades; each grade is divided into 100 minutes, and each minute into 100 seconds. These minutes and seconds are called "centesimal," and the signs ' and " are used to distinguish them. Revised by Simon Newcomb.

Degree (in music): one of the lines or spaces of the staff upon which the notes are marked. When notes are on the same line or space, they are on the same degree, even though one of the notes should be raised by a sharp or lowered by a flat.

Degrees: scholastic distinctions. These fall under two classes. First, those which are given as a testimonial of the completion of a certain prescribed course of study; and second, honorary degrees conferred by the faculty and trustees of institutions of learning upon persons of distinction, not only in scholarship but in other lines as well. Originally the degree signified simply that the holder was qualified to teach in a university. The master's degree was the one first employed; at the University of Bologna, in the twelfth century, the degree of doctor apparently was substituted for it. Innocent III., in 1215, promulgated a body of statutes for the University of Paris, which stated that the bachelor should begin by explaining sentences in the school of some doctor for the space of a year; he was then examined by the chancellor of the Cathedral of Paris, and, if successful, became a licentiate until he received the degree of doctor, when he could open a school of his own. The degree of doctor was first given in England under King John about 1207. The mediæval university included the four faculties of arts, law, medicine, and theology. The term master gradually became restricted to the teacher in the first of these, and that of doctor to the other three. The pope, the recognized head of all universities, granted the right to confer degrees during the Middle Ages. He now exercises the privilege of conferring degrees directly upon whom he will. The government in modern states confers this right on institutions by charter. The degree of bachelor is now usually granted at the completion of a four years' course of collegiate study. The degree of master requires a period of graduate study thereafter. The degree of doctor, regarded as the highest academic distinction, is the only degree conferred by German universities, except that of licentiate, which is conferred by theological faculties alone. The title Doctor of Medicine entitles its holder to practice medicine. In a similar way certain other degrees, as that of Civil Engineer, Doctor of Dental Surgery, etc., denote the fitness of the possessor to practice his profession. The degree of Doctor of Philosophy ranks as the highest distinction to be won outside of professional scholarship. The universities of the U. S. have established graduate courses, and grant this degree on substantially the same lines as those followed in the best German universities. There is, however, no uniformity of practice in the matter of conferring degrees, although the condition of affairs in this respect is much better in Europe than in the U. S.; and the tendency seems to be to restore to the degrees the dignity and distinction that originally belonged to them. The original degrees of Bachelor of Arts, Master of Arts, Doctor of Philosophy, Doctor of Theology, Doctor of Medicine, and Doctor of Law have been very greatly increased in number, so that now a person may be bachelor, or master, or doctor of almost anything. In Germany there are twenty-one universities with the right to confer degrees; in Great Britain a much smaller number; while in the U. S. there are at least 300 colleges and universities entitled to exercise this right.

The University of London is a body which examines and grants degrees, but gives no instruction. The University of the State of New York is the only similar institution in the U. S. As a rule, the degrees represent knowledge acquired, in part at least, in the institution conferring them.

See University, Doctor, College, and Compayré, *Abelard and the Origin and Early History of Universities*. The requirements for obtaining degrees from various institutions of learning will frequently be found stated in the descriptions of these institutions. C. H. Thurber.

Degrees of Latitude and Longitude: The distance from the equator to the poles, along a meridian, is called *latitude*, or width; the distance from an assumed prime meridian, along a parallel, in the direction of the earth's rotation, is called *longitude*, or length. These expressions have been handed down to us by the ancients, who used them because the world known to them was really more extensive, or long, from east to west, than wide, from north to south. The degrees of latitude are counted from the equator as zero, both north and south, making ninety degrees each way to the poles. It would be most desirable that all civilized nations should also agree on a prime meridian from which the degrees of longitude should be uniformly counted; but it is not so. The British count 180 degrees east and 180 degrees west from the meridian passing through their national observatory at Greenwich, near London; the French start from the meridian of their observatory at Paris; the Germans often take the meridian of Ferro, the most western of the Canary islands, because it leaves all the lands of the Old World to the east and those of the New World to the west; the Americans often use the meridian of the National Observatory at Washington. Therefore, when the longitude of a place is mentioned, the prime meridian from which it is reckoned must be indicated. The seafaring nations mostly use Greenwich longitude; the nations on the continent of Europe, Paris and Ferro.

The meridians being all great circles, the length of their degrees, or of the degrees of latitude, is about uniform; they only show slight elongation toward the poles, due to the polar compression. But the degrees of the parallels which mark the longitudes are rapidly decreasing with the circumference of the circles from the equator to the poles, as shown in the following table:

LENGTH OF DEGREES OF LONGITUDE IN DIFFERENT LATITUDES, IN ENGLISH MILES.

Degrees of latitude.	Length of degrees.	Circumf. of parallel.	Degrees of latitude.	Length of degrees.	Circumf. of parallel.
Equator	69·16	24,899	50°	45·55	16,037
5°	68·90	24,805	55	39·76	14,314
10	68·12	24,523	60	34·67	12,482
15	66·82	24,056	65	29·31	10,553
20	65·02	23,407	70	23·73	8,542
25	62·72	22,580	75	17·96	6,466
30	59·95	21,581	80	12·05	4,339
35	56·72	20,419	85	6·84	2,464
40	53·06	19,101	90	0·00	Pole.
45	48·99	17,636			

The length of a minute of a degree of the equator is called a *geographical* mile, of which, therefore, there are sixty in one degree. This is the same as the nautical mile, used by all mariners in computing distances at sea. One degree of the equator contains 69·16 English statute miles. See Earth.

De Grey, Earl: See Ripon, Marquis of.

De Haas, de-haas', Maurice Frederick Hendrick: artist; b. in Rotterdam, Holland, in 1832; a pupil of Louis Meyer and other eminent artists. He gave much attention to marine-painting, in which he early acquired distinction. In 1857 he was appointed artist to the Dutch navy. In 1859 he emigrated to New York. His pictures are marked by vigorous and effective drawing, and by fidelity to nature. His *Farragut Passing the Forts* is his best-known American work, D. in New York, Nov. 23, 1895.—His brother, William Frederick De Haas (1830–80), also was a marine-painter, and removed from Rotterdam to New York in 1854.

Dehli: See Delhi.

Deh'ra, or **Dehra Dun**: a district of Meerut, Northwestern Provinces, British India; at the foot of the Himalayas, between the Ganges and Jumna rivers. It comprises the

valley (*dun*) of the Dehra and adjacent hills. Area, 1,193 sq. miles. It is well wooded, undulating, and well watered by natural and artificial channels. Tea cultivation and the rearing of silk-worms are thriving industries. Rice, oil-seeds, millet, potatoes, and peppers are extensively cultivated. The principal town is Dehra, the headquarters of the great trigonometrical survey of India; pop. about 9,000. It is in lon. 78° E., lat. 30° 20′ N. (see map of Northern India, ref. 4–E). The hill station Mussooree is a favorite summer resort with a population which fluctuates with the season. Landaur, near by, is a military dépôt for European convalescents. Total pop. about 150,000.

Deipnosophists: See ATHENÆUS.

Deists [from Lat. *deus*, God]: a loosely defined body of thinkers having their principal development in England from the last part of the sixteenth century to the middle of the eighteenth. With several beliefs in common, they differed widely in regard to a future life and other matters. Their temper was not less believing than that of their orthodox opponents. They rejected revelation because man's natural reason seemed to them perfectly adequate to assure him of the existence of God and the right form of worship, viz., the practice of virtue and enthusiasm for the beneficent order of the world. That their God was a mechanical creator, but, having made the world, he was indifferent to its concerns, is an idea often unwarrantably attributed to them as a class. They rejected the Trinity, the deity of Christ, vicarious atonement, the supernatural or infallible inspiration of the Scriptures. In general, they regarded the Scriptures as made up of higher and lower things, the former a republication of natural religion, the latter the additions of the crafty and the superstitious. Lord Herbert of Cherbury (1581–1648), called the "Father of Deism," expressed the positive aspects of the system, but dealt little in negation. His temper was less purely intellectual and more religious than that of his successors. Blount, the first of these (1654–93), developed Hobbes's objections to the Mosaic authorship of the Pentateuch; argued the inconsistency of the Mosaic cosmology with the Copernican; and by an examination of the alleged miracles of Appolonius of Tyana endeavored to discredit those of Christ. He set the Deistical habit of regarding religious doctrines and practices as the inventions of designing men. Shaftesbury (1671–1713) differed widely from the other Deists, often criticising them. While the most intellectual and powerful writer of them all, his plea was for the emotional origin and character of religion. Toland (1670–1722) argued that true Christianity is not mysterious, and rudely anticipated the Tübingen criticism of Christian origins. Collins (1676–1729) was strongest in his attack on prophecy as an evidence of Christianity; Woolston (1669–1733) against the miracles. Tindal (1657–1733) sought to make out that Christianity is "as old as the creation." Chubb (1679–1764) was one of the least learned and most systematic; Bolingbroke (1678–1751), the most satirical and ironical. Voltaire, the chief of the French Deists, adopted his opinions and his methods; Diderot's position was similar; Rousseau's that of the more religious. Gibbon's famous chapters on Early Christianity are belated Deism, and Paine's *Age of Reason* reproduced its leading ideas, positive and negative. With many shrewd anticipations of the higher criticism of the nineteenth century, Deism was singularly lacking in the historic sense and in any real appreciation of the forces by which religions and their sacred books are developed. See Leslie Stephen's *History of English Thought in the Eighteenth Century* (2 vols. 1876). JOHN W. CHADWICK.

Dejani'ra, or **Deianeira** [in Gr. Δηϊάνειρα, or Δηάνειρα]: in Greek mythology, a daughter of Œneus, King of Ætolia, and the wife of Hercules. She preserved some blood of the centaur Nessus as a love-charm, with which she saturated a tunic of Hercules, who was poisoned by wearing it.

Dejazet, *de-zhaă'zā'*, PAULINE VIRGINIE: actress; b. in Paris, Aug. 30, 1797. She made her *début* on the stage as Fanchon toute seule when she was five years old, and played Bonaparte à Brienne when she was seventy-five. Her best impersonations were those of boys and young men. In 1859 she bought the Théâtre des Folies-Nouvelles, which, after her, is called "Théâtre Dejazet." She left the stage in 1868, and died in Paris, Dec. 1, 1875.

De Jure: See DE FACTO.

DeKalb: city; on railway; DeKalb co., Ill. (for location of county, see map of Illinois, ref. 2–E); 58 miles W. of Chicago; has 9 churches, 3 graded schools, barbed-wire factories, large wire-drawing plant, foundry, agricultural-implement factory, shoe-factory, glove and mitten factory, machine-shop, and various smaller manufactories. The increase in population since 1890 is due to the opening of new industries. Pop. (1880) 1,598; (1890) 2,579; (1900) 5,904.
EDITOR OF "CHRONICLE."

De Kalb, *de-kaalp'*, JOHN, Baron: general; b. in Hüttendorf, Bavaria, July 29, 1721; served first in the French army, and was promoted to the rank of brigadier-general. He removed to the U. S. with La Fayette in 1777, and was appointed a major-general by Congress in the same year. He served under Washington in Pennsylvania and New Jersey until the spring of 1780, and then became the second in command in the army of Gen. Gates. He was mortally wounded at the battle of Camden, S. C., and died Aug. 19, 1780. See Kapp, *Leben des Amerikan. Generals, Joh. Kalb* (1862). A bronze statue of De Kalb was unveiled at Annapolis, Md., Aug. 16, 1886.

DeKay, CHARLES: poet and journalist; b. in Washington, D. C., July 25, 1848; graduated at Yale College, and has been literary editor of the New York *Times* and consul-general at Berlin. Author of *Hesperus* (1880); *The Vision of Nimrod* (1881); *The Love Poems of Louis Barnaval* (1883); *Life of Barye* (1889); and *Bird Gods* (1898).

Dekkan: a geographical designation in India. See DECCAN.

Dekker, THOMAS: dramatist. See DECKER.

De Kov'en, REGINALD: musician; b. in Middletown, Conn., Apr. 3, 1859; graduated B. A. at St. John's College, Oxford University, in 1879; studied music in Stuttgart; received the degree of Mus. Doc. from Racine College 1890. He has composed many songs and several operas, chief of which are *Don Quixote* (1890); *Robin Hood* (1891); *The Fencing Master* (1892); *The Knickerbockers* (1892)—all of which have been successfully performed. He has written musical criticisms for the Chicago *Post*, New York *World*, and *Harper's Weekly*. D. E. HERVEY.

De la Beche, *de-laă'besh'*, Sir HENRY THOMAS, F. R. S.: geologist; b. near London in 1796. He began the geological mapping of Great Britain as an *attaché* to the Ordnance Survey, and afterward secured an independent organization, thus founding the first official geological survey. Among his works are a *Geological Manual* (1832) and the *Geological Observer* (1851). D. in London, Apr. 13, 1855.

Delaborde, *de-laă'bōrd'*, HENRI, Vicomte: historical painter; b. at Rennes, May 2, 1811; pupil of Paul Delaroche; first-class medal, Salon, 1847; officer Legion of Honor 1870; member of the Institute 1868; is a distinguished critic and writer on art. *Knights of St. John of Jerusalem* (1845) is in the Versailles Museum; *Hagar in the Desert* (1836) in the museum at Dijon; *Passion of Christ* (1848) in Amiens Cathedral. W. A. C.

Delacroix, *de-laă'krwaă'*, FERDINAND VICTOR EUGÈNE: figure-painter; b. at Charenton-Saint-Maurice, near Paris, Apr. 26, 1799; pupil of Guérin. He was the leader of the revolt against the bombastic classical style of David, and the chief of the Romantic school of 1830. The revolt was really begun by Géricault, who did not live to carry on the war, and a considerable part of the glory that rightly belongs to him is attributed to Delacroix. Delacroix first came into notice in 1822, when he exhibited his picture of *Dante and Virgil in Charon's Bark* (now in the Louvre). It is one of the best of his works. The battle between the romanticists and the classicists was a very hot one, and is not entirely fought out to this day. How much of the fame of Delacroix belongs to his part in founding a new school in art and how much is due to his merits as an artist it is difficult to determine. It is probable, however, that his ability has been exaggerated, and that time will bring a more modest estimate of his worth and artistic balance as a colorist, while not detracting from his value as the prime factor in the development shown in the art of painting since his advent. He has high reputation as a colorist, and it is certain that he was wonderfully gifted in this respect. In his work he is at times flighty and fiery in the bewildering richness of a multitude of glowing tints; in others, as in the *Battle of Taillebourg* (Versailles Museum), he is almost unintelligible. The *Entry into Constantinople* (Louvre) is perhaps his completest and finest work. In spite of faults and insufficiencies in the matter of form in his work, it is, taken as a whole, of extraordinary brilliancy and power. His influence on the

modern French school was very great, and with him and with Géricault began a transformation in the art of painting that has affected every school of art in the world. D. in Paris, Aug. 13, 1863. WILLIAM A. COFFIN.

De Laet: See LAET.

Del'afield, EDWARD, M. D.: physician; b. in New York city in 1794; graduated at Yale College in 1812 and at the College of Physicians and Surgeons in 1815. Soon after this he went to London, remained abroad about a year, and on his return to New York, in conjunction with Dr. J. Kearny Rodgers, he established the New York Eye and Ear Infirmary in 1820. In 1825 he was appointed a professor in the College of Physicians and Surgeons; in 1834 was appointed physician to the New York Hospital; in 1842 organized the Society for the Relief of the Widows and Orphans of Medical Men, and was its first president; in 1866 was elected president of the medical board of the Women's Hospital; in 1858 was elected president of the College of Physicians and Surgeons; in 1870 became, by virtue of his presidency, one of the governors of the Roosevelt Hospital, and was elected first president of the board of governors. D. Feb. 13, 1875.

Delafield, RICHARD: U. S. military officer: b. Sept. 1, 1798, in New York city; graduated at West Point in 1818; chief of engineers Apr. 22, 1864, with the rank of brigadier-general. He was engaged in many important works of engineering, and when the civil war broke out served on the staff of Gov. Morgan, of New York, to reorganize and equip State forces for the service 1861–63; in command of corps of engineers and in charge of engineer bureau, Washington, D. C., 1864–66; as inspector of Military Academy 1864–66; as member of lighthouse board and of commission for the improvement of Boston harbor 1864–70; and as regent of Smithsonian Institution 1865–70; brevet major-general U. S. army Mar. 13, 1865, for faithful, meritorious, and distinguished service in the engineer department; and retired from active service Aug. 8, 1866. D. in Washington, D. C., Nov. 5, 1873.

Delago'a Bay (i. e. lagoon bay): an inlet of the Indian Ocean; in Southeastern Africa; 55 miles long and about 25 miles wide. It is about lat. 26° S. and lon. 33° E. The surrounding country is very insalubrious, but the bay is commodious and safe. It was discovered by Vasco de Gama in 1498, and shortly after the Portuguese founded the factory of Lourenço Marques. It seemed, however, as if the Portuguese exercised no jurisdiction in the country, and in 1822 Capt. Owen hoisted the British flag and appropriated the territory. But on his return, in 1823, he found the Portuguese governor in possession of the country, and strife began. The question attracted no attention, however, until, in 1868, the Transvaal republic, the Boers having made a settlement there in 1835, incorporated the country. The case was then laid before the president of the French republic for arbitration, and on Apr. 19, 1875, Marshal MacMahon declared in favor of the Portuguese claim. A railway to Pretoria, begun by British and American capital, was confiscated by Portugal in 1889. The question of indemnity was submitted for arbitration to the Swiss Federal Council in 1891. Mar. 29. 1900, Portugal was ordered to indemnify the original concessionaires to the extent of £28,000 plus 15,314,000 francs, with simple interest at 5 per cent. from June 25, 1889, the date of the seizure.

Delambre, de-läN'b'r, JEAN BAPTIST JOSEPH: astronomer; b. at Amiens, France, Sept. 29, 1749; studied under Lalande. He produced *Tables of the Orbit of Uranus* in 1790, and in 1792 *Tables of Jupiter's Satellites.* In the service of the Government Delambre and Méchain spent about seven years (1792–99) in the measurement of the arc of the meridian from Dunkirk to Barcelona. Delambre published the result of this operation in his *Base du Système Métrique Decimal* (1806–10). He was admitted into the Institute in 1795, became perpetual secretary of the Academy of Sciences in 1803, and Professor of Astronomy in the College of France in 1807. Among his numerous works are a *History of Ancient Astronomy* (1817); a *History of Mediœval Astronomy* (1819); and a *History of Modern Astronomy* (1821). D. Aug. 19, 1822. See Fourier, *Éloge de Delambre.*

De Lan'cey, EDWARD FLOYD: See the Appendix.

De Lancey, JAMES: jurist; b. in New York in 1703; the son of a Huguenot from Normandy. He was educated at Cambridge, England; returned to New York in 1729: in the following year formed one of a commission to frame a new charter for the city, and the instrument known as the Montgomery charter was drawn up chiefly by him; became a justice in the supreme court of the province 1731, and in 1733 its chief justice. He was one of the founders of King's (now Columbia) College, and was lieutenant-governor for several years. He was a man of great talents, wealth, and learning, but is said to have been unprincipled and intriguing. Several members of the De Lancey family were prominent and bitter Tories during the Revolutionary war, but they were in general men of remarkable talents. D. in New York, Aug. 2, 1760.

De Lancey, WILLIAM HEATHCOTE, D. D., LL. D., D. C. L. (Oxon.): P. E. bishop; b. at Mamaroneck, N. Y., Oct. 8, 1797; graduated at Yale in 1817; was ordained deacon in 1819, priest in 1822; was provost of the University of Pennsylvania 1827–32, and was consecrated bishop of Western New York in 1839. D. in Geneva, N. Y., Apr. 5, 1865.

Deland: city; capital of Volusia co., Fla. (for location of county, see map of Florida, ref. 4–J); on railway in the center of a great orange belt; has five churches, and is the seat of John B. Stetson University, which has a large endowment and fine buildings. Pop. (1890) 1,113; (1900) 1,449. EDITOR OF "NEWS."

Deland, MARGARETTA WADE (*Campbell*): poet and novelist; b. at Alleghany, Pa., Feb. 23, 1857; educated at New Rochelle, N. Y.; taught industrial drawing in New York city. She was married in 1880 to L. F. Deland, of Boston, where she has since resided. She published a volume of verse, *The Old Garden*, in 1886; *John Ward, Preacher*, a theological novel which has had wide popularity (1888); *Florida Days* (1889); *Sidney* (1889); *The Story of a Child* (1892); *Mr. Tommy Dove and other Stories* (1893); *The Wisdom of Fools* (1895); *Philip and His Wife* (1898).

Delane, JOHN THADEUS: journalist; b. in London, Oct. 11, 1817; educated at King's College, London, and at Oxford; in May, 1841, when not yet twenty-four, he became editor of the *Times*, and held the position for thirty-six years, during which period the paper attained an influence unparalleled in the history of journalism. He resigned the editorship in 1877, and died Nov. 22, 1879. C. H. T.

Delano, COLUMBUS, LL. D.: lawyer; b. in Shoreham, Vt., June 5, 1809; removed in his early youth to Ohio. He practiced law with distinction, and was chosen a member of Congress in 1844. Having joined the Republican party, he was again elected to Congress in 1864. He became commissioner of internal revenue in Mar., 1869, and Secretary of the Interior in the cabinet of President Grant in Oct., 1870. D. Oct. 22, 1896.

Delanoy, de-läN'nwäN', HIPPOLYTE PIERRE: still-life and genre painter; b. in Glasgow, Scotland, of French parents; contemporary. Pupil of Gleyre, Barrias, Bonnat, and Vollon; third-class medals, Salon, 1879, and Paris Exposition, 1889. *At Don Quixote's* is in the Luxembourg Gallery. His work is excellent; highly finished. Studio in Paris.

De la Ramé, de-läN-räN'mā', LOUISA: British novelist of French extraction (known in the literary world as "Ouida"); b. at Bury St. Edmunds in 1840. Her pseudonym was a childish mispronunciation of "Louisa." Her novels, some twenty-five in number, are popular but sensational and high-colored fictions. Some of them are *Strathmore* (1865); *Under Two Flags* (1867); *In a Winter City* (1876); *In Maremma* (1882); *Guilderoy* (1889). She has resided in Florence, Italy, for many years. H. A. BEERS.

Delaroche, de-läN'rōsh', HIPPOLYTE (called *Paul*): historical painter; b. in Paris, July 17, 1797; pupil of Baron Gros; grand gold medal, Salon, 1824; officer Legion of Honor 1834; member of the Institute 1832; professor at the École des Beaux-Arts. He painted the famous *Hemicycle* in the École, 1838–41. *Charlemagne Crossing the Alps* (1847) is in the Versailles Museum, and *The Princes in the Tower*, one of his most famous works, and the *Death of Queen Elizabeth* are in the Louvre. He was a pronounced classicist. D. in Paris, Nov. 4, 1856. W. A. C.

De la Rue, WARREN, Ph. D., F. R. S.: English physicist and inventor; b. in the island of Guernsey, Jan. 18, 1815; educated in Paris; afterward followed his father's employment as wholesale stationer and manufacturer of card paper. He invented processes for photographing the heavenly bodies, improvements in color-printing, in envelope-folding machines, in oil-refining, etc., and published important reports of original observations in chemistry, astronomy, and physics. D. Apr. 19, 1889.

Dela'tor, in the plural **Delatores** [Lat. deriv. of *defer're, dela'tum*, carry off]: a Latin word, literally meaning carrier; applied in course of time to the carriers of evil reports, informers, or public spies. Under the Roman emperors the delatores were a class of men who gained their living by informing against their fellow-citizens. They constantly brought false charges forward to gratify the jealousy or avarice of the different emperors, and were generally paid according to the apparent consequence of the information they gave, although in some cases the law specified the sums which were to be given to informers. Thus if a murder had been committed in a family, and any slaves ran away before inquest (*quæstio*) had been made, whoever apprehended such slaves received for each one so apprehended five pieces of gold from the estate of the deceased, or, if the estate could not pay it, the government gave the reward. At various times attempts were made to regulate the pay of public spies and informers, who at last became so numerous, and gave rise to so much trouble in society, that the emperors were obliged to expel and variously punish great numbers of them.

Delaunay, de-lō'nā', Charles Eugène, F. R. S. L.: mathematician and astronomer; b. near Troyes, France, Apr. 9, 1816; educated at the Polytechnic School, where he graduated in 1836 with the highest honors. He was subsequently appointed principal engineer of mines of the first class, and Professor of Mechanics in the Polytechnic School and in the Faculty of Sciences. He was also an officer of the Legion of Honor, a member of the Institute, and was the recipient of numerous native and foreign honors and distinctions. He became a member of the Academy in 1855, of the bureau of longitude in 1862, and director of the Parisian Observatory in 1870. He wrote, among other works, *Traité de Mécanique Rationelle* (3d ed. 1862); *Théorie de la Lune* (1866); *Rapport sur le Progrès de l'Astronomie* (1867). He was drowned at Cherbourg, Aug. 5, 1872.

Delaunay, Jules Élie: figure and portrait painter; b. at Nantes, France, June 12, 1828; pupil of Flandrin; Grand Prix de Rome 1856; third-class medals, Salon, 1859, and Paris Exposition, 1867; first-class medal, Paris Exposition, 1878; officer Legion of Honor 1878; medal of honor, Paris Exposition, 1889; member of the Institute 1879. His portraits are among the finest in modern art, and his work is distinguished by the most artistic qualities of drawing and composition. His *Death of the Centaur Nessus* is in the museum at Nantes, and *Diana* is in the Luxembourg Gallery, Paris. He has done important decorative work, including several churches and the stairway of the new Hotel de Ville, Paris. D. in Paris, Sept. 5, 1891.

Delaunay, Louis Arsène: French actor; b. Mar. 21, 1826, in Paris; appeared at the Odéon 1845; played the part of the son in *L'univers et la maison* 1846; 1848 appeared in *Le Menteur* at the Théâtre Français, and in *Pythias et Damon*; he has shown particularly as Télémaque and Hernani.

Del'avan: city and railway junction; Tazewell co., Ill. (for location of county, see map of Illinois, ref. 5–D); 157 miles S. W. of Chicago. It has a library, a high school, a park, and various manufactures. Pop. (1880) 1,340; (1890) 1,176; (1900) 1,304.

Delavan: village (settled in 1836); Walworth co., Wis. (for location of county, see map of Wisconsin, ref. 7–E); on railway, and on Turtle Creek; 58 miles S. W. of Milwaukee; has the State institution for the deaf and dumb, a foundry, cheese factories, etc. There are mineral springs here, and the village is a place of summer resort. Pop. (1880) 1,798; (1890) 2,038; (1900) 2,244. Editor of "Republican."

Delavigne, de-laă'veeñ', Jean François Casimir: dramatist; b. in Havre, France, Apr. 4, 1793. After the Restoration he wrote a series of patriotic lyrics called *Messéniennes*, which were received with favor. The dramas *Les Vêpres Siciliennes* (1819), *Les Comédiens* (1820), and *Le Paria* (1821) increased his fame. In 1830 he wrote *La Parisienne* and other revolutionary songs. Delavigne occupies an intermediate position between the Classical and Romantic school. There are more piquancy and realistic sentences in his delineations of characters than in those of Voltaire, but less passion and fire of imagination than in those of Victor Hugo. D. Dec. 11, 1843.—His brother, Germain Delavigne, b. Feb. 1, 1790, wrote with Casimir the words to Halévy's opera of *Charles VI.*, and in collaboration with Scribe *Le Vieux Garçon* and other vaudevilles. D. Nov. 1, 1868.

Delaware (named in honor of Lord Delaware, second Governor of Virginia): a river of the U. S.; rises in New York, and is formed by the Coquago and the Popacton, which unite at Hancock on the boundary between New York and Pennsylvania. It flows southeastward to Port Jervis on the Erie R. R., and reaches the northern extremity of New Jersey. Below this point it forms the boundary between Pennsylvania and New Jersey, and runs southwestward to the Delaware Water Gap, where the river passes through a picturesque gorge in the Kittatinny Mountain. Thence it flows southward to the northern extremity of Bucks County, and southeastward to Trenton, where it meets tide-water. Below Bordentown it flows southwestward until it enters Delaware Bay, about 40 miles below Philadelphia. Its whole length is about 300 miles. It is navigable for steamboats to Trenton, and ships of the largest size can ascend to Philadelphia, where it is nearly a mile wide. It is connected with the Hudson river by the Morris Canal and the Delaware and Hudson Canal. Large numbers of shad are caught in the Delaware.

Delaware: one of the Middle Atlantic States, and one of the original thirteen. It is situated between 38° 28′ and 39° 50′ N. lat. and 75° and 75° 46′ W. lon. It is 96 miles long and from 9 to 37 miles wide. Bounded N. and N. N. W. by Pennsylvania, E. by Delaware river and bay and the Atlantic, S. and W. by Maryland. Area, 2,050 sq. miles.

Topography.—The peninsula bounded by Chesapeake and Delaware Bays and the Atlantic, of which Delaware forms the northeast portion, is generally nearly level and, except on Delaware river and bay, sandy. There are no mountains, but some rolling lands with hills and valleys in the N.; but below New Castle a sandy and somewhat marshy ridge only relieves the eye from gazing on a dead level. This ridge is nowhere above 70 feet in height, runs near the west boundary of Delaware, and forms the backbone of the peninsula. The affluents of the Delaware river in the E. and of the five or six streams falling into Chesapeake Bay have their sources in this low ridge. There are three shallow bays or sounds, landlocked by spits of sand, below Cape Henlopen—viz., Rehoboth Bay, Indian River Bay, and the north portion of St. Martin's Bay. Most of the larger streams and bays are navigable for vessels of light draught, but only the Delaware river and bay and Christiana creek are navigable for large ships and steamers. Rehoboth Bay admits vessels drawing 6 feet of water. Delaware Bay is a fine body of water, with a deep though tortuous channel, having from 35 to 75 feet of water. The only good harbors in the State are those of Wilmington on Christiana Creek, New Castle, and Lewes.

Minerals.—Bog-iron ore, found in all the swamps, shell marl, in the greensand region, and kaolin or porcelain clay are abundant.

Zoölogy.—There are few wild animals in the State, except that many formidable reptiles are to be found in the swamps. The shores of Delaware Bay are frequented by immense flocks of ducks and teal, as well as by wild geese; the other birds of the State are those common to the Middle Atlantic States.

Soil and Vegetation.—In the swamps there are extensive forests of cypress and other evergreen trees and shrubs of a semi-tropical character, as well as bog-oak, huckmatack, etc. Elsewhere in the State there are no extensive forests, the land being almost wholly under cultivation. The soil for eight or ten miles inland from Delaware Bay is for the most part a rich clayey loam, but west of this it is sandy, and requires constant fertilization in order to produce heavy crops. The swamp lands, when reclaimed, are very productive.

DELAWARE

M O 75° P

Scale of Miles
0 5 10 15
County Towns

PENNSYLVANIA
NEW JERSEY
DELAWARE BAY
ATLANTIC OCEAN

NEW CASTLE
KENT
SUSSEX

Chatham, Mendenhall, Booth Corner, Chester, Ayondale, Beaver Valley, Graceville, Claymont, Centreville, Greenville, Ashland, Rockland, Grubbs, Kaolin, Yorklyn, Hockessin, Mt. Cuba, Henry Clay Factory, Bellevue, Oxford, Landenberg, Wooddale, Faulkland, Marshallton, Wilmington, Edgemoor, Mermaid, Thompson, Pleasant Hill, Stanton, Christiana Cr., Penn's Grove, McClellandsville, Newport, Newark, Hare's Cor., New Castle, Christiana, State Road, Williamstown, Unionville, Pennsville, Sharpstown, Cooch's Bridge, Chippewa, Red Lion, Elkton, Glasgow, Ft. Delaware, Kirkwood, Delaware City, St. George's, Salem Cove, Salem, Summit Bridge, Chesapeake & Del. Can., Chesapeake City, Newfield, Landisville, Mt. Pleasant, Port Penn, Cohansey, Elk River, McDonough, Middletown, Odessa, Fieldsboro, Taylor's Bridge, Bridgeton, Maurice R., Sassafras River, Townsend, Deakyneville, Greenwich, Forest, Blackbird, Bay Side, Vandyke, Green Spring, Bombay Hook, Bombay Hook Pt., Old Duck Cr., Delaney's, Duck Cr., Port Elizabeth, Massey, Smyrna, Clayton, Newport, Brenford, Chester R., Kenton, Leipsic, Port Norris, Down's Chapel, Cheswold, Deep Water Pt., East Creek, St. Jones Cr., Little Creek, Pearson's Corner, Hartly, DOVER, Egg Island Point, Merrickton, Hazlettville, Wyoming, Lebanon, Camden, Rising Sun, Green Cr., Hayden, Willow Grove, Woodside, Magnolia, Bowers, Petersburg, Sandtown, Viola, Canterbury, Goldsborough, Felton, Murderkill Cr., Frederica, Greensborough, Hollandville, Thorn Pt., Queen Anne, Harrington, Houston Sta., Vernon, Milford, Cape May Pt., Cape May, Denton, Farmington, Lincoln, Adamsville, Lewes Cape, Delaware Breakwater & Light House, Cape Henlopen, Greenwood, Ellendale, Milton, Drawbridge, Lewes, Robbins, Cool Spring, Nassau, Redden, Midway, Bridgeville, Harbeson, Rehoboth, Rodney, Federalsburg, Cannon, Georgetown, Hollyville, Angola, Middleford, Oak Grove, Seaford, Stockley, Concord, Hurlock, Shortly, Indian R. Inlet, Indian River, Indian R. Bay, Woodland, Millsboro, Bethel, Laurel, Dagsboro, Ocean View, Mission, Waplesville, Blackwater, Linkwood, Lowe's Cross Roads, Frankford, Roxanna, Williamsville, Vienna, Delmar, Whitesville, Gumboro, Selbyville, Twilley, Bishopville

Longitude 75°30′ West from Greenwich

The *climate* is mild and favorable for farming; healthful in the north and center; some remittent and intermittent fevers prevail in the swampy regions in the south.

Agricultural Products.—Delaware is eminently a fruit-growing State. Peaches, apples, and small fruits raised here are in demand in the New York and Philadelphia markets, and, in connection with New Jersey and Maryland, she supplies certainly seven-tenths of the entire demand for these products. In 1880 were reported 8,749 farms, of which 6,745—more than three-quarters—were of 50 acres or more; of the whole number 3,708 (about three-sevenths) were rented, and two-thirds of these were rented for pay in kind (generally fruit). Farms occupy about ten-thirteenths of the entire area. In 1900 Delaware produced 5,010,312 bush. of Indian corn, 1,479,139 bush. of wheat, and 332,724 bush. of oats. About 50,000 tons of hay are annually harvested. Potatoes, sweet potatoes, and all garden vegetables are very largely produced. The live stock of the State in 1899 was 31,192 horses, 4,879 mules and asses, 22,305 working oxen and other cattle, 35,730 milch cows, and 12,592 sheep. The peach crop varies in favorable years from 3,300,000 to 4,000,000 baskets or crates. The apples, pears, quinces, and small fruits produced are together worth more than the peaches.

Manufactures.—Delaware has extensive manufactures, Wilmington being the center of some important interests; the principal are iron, mostly rolled, flour and meal, morocco and leather; ship-building, iron and wood; machinery, car-wheels, etc.; railway and horse cars; cotton goods, paper, powder and chemicals, carriages and wagons; canned provisions, vegetables, and fruits; tobacco, cigars, cigarettes, and snuff; woolen goods, boots, shoes, and findings.

Railways.—There were on June 30, 1899, 351.12 miles of railway in operation in Delaware. These lines penetrate each county. Trunk roads to Baltimore, Washington, and the South pass through the northern part of the State.

Finances.—The total debt Jan. 1, 1900, was $819,750; assessed valuation, about $75,000,000. The State annual revenue, as well as that of Wilmington, exceeds expenditure. While the nominal State debt, as given above, was $819,750, the State owns $1,024,452 in bank stocks and railway mortgages, and is practically free from debt. There is no State taxation in Delaware, but the county and municipal taxes raised amount to about $1,000,000 annually.

Commerce.—Though the foreign commerce of Delaware is conducted mostly through Philadelphia and Baltimore, yet the Delaware district, of which Wilmington is the port, had $2,912,772 of exports and $178,633 imports in the seven months ending Feb. 1, 1901. Wilmington has a line of steamers plying regularly to New York, and steam and sailing vessels of lighter draught run to various ports in the State.

Banks, etc.—Delaware had, Sept. 5, 1900, 19 national banks in operation, with a capital of $2,133,985, and $6,252,694.77 individual deposits; the outstanding circulation was $850,383. There were in 1900 6 State banks, savings-banks, and private banking-houses, having an aggregate capital of $1,600,000; deposits, $10,035,837. There were also four local fire insurance companies and twenty-two mutual life insurance companies in the State doing business in Delaware.

Newspapers and Libraries.—There were in 1900 42 newspapers and other periodicals in the State—6 daily, 30 weekly, and 6 monthly. There are also 18 public libraries, having an aggregate of about 65,000 volumes.

Churches and Education.—The number of churches of all denominations is about 300; the Methodists (Episcopal and Protestant) lead, and are followed in their order by Presbyterians, Episcopalians, Baptists, Roman Catholics, Friends, Lutherans, and five or six minor denominations. Delaware had in 1899 48,830 children of school age, of whom 33,174 were enrolled in the public schools; number of school-houses, 497; value of school property, about $904,426. There are 840 teachers (218 men, 622 women); total receipts and expenditure for these schools, about $275,000. The city schools of Wilmington are excellent. There is one normal school with 2 teachers and 25 students; 10 teachers' institutes held. There is one State college at Newark, with scientific and normal departments; a college at Wilmington. There are also 13 academies, seminaries, or high schools, but no professional schools.

Population.—In 1790, 59,096; in 1830, 76,748; in 1870, 125,015; in 1880, 146,608 (white 120,160, colored 26,448); in 1890, 168,493 (white 140,066, colored 28,427, including 37 Chinese and 4 Indians); in 1900, 184,735.

COUNTIES.	* Ref.	Pop. 1890.	Pop. 1900.	COUNTY TOWNS	Pop. 1900.
Kent	5-N	32,664	32,762	Dover	3,329
New Castle	3-N	97,182	109,697	Wilmington	76,508
Sussex	7-N	38,647	42,276	Georgetown	1,658
Totals	....	168,493	184,735		

* See map of Delaware.

Principal Towns and Population 1900.—Wilmington, largest city, 76,508; Dover (capital), 3,329; New Castle, 3,380; and Smyrna, 2,168. North Milford, Seaford, Lewes, Laurel, Delaware City, South Milford, Georgetown, and Newark are important towns.

Government.—Under the constitution of 1897, governor and lieutenant-governor are elected for four years, senate (17 members) for four years, house of representatives (35 members) for two years.

History.—Named from the bay and river; first settlement by Dutch under De Vries, 1630, near Lewes; colony destroyed by Indians. In 1637 Swedes and Finns bought the land from Cape Henlopen to Christiana creek, and built a fort at the mouth of the creek, calling the country New Sweden; the Dutch at New Amsterdam built a fort at New Castle, 5 miles below; after some difficulties the Dutch captured New Sweden in 1655, and expelled those who would not swear allegiance to Holland. In 1664, when the New Netherlands were conquered by the English, the Duke of York claimed Delaware as belonging to him; Lord Baltimore also claimed it; William Penn purchased it in 1685, and it was called "the territories," and regarded as a part of Pennsylvania for twenty years. In 1703 it had a distinct legislature, but until 1776 was under the Pennsylvania government, and the Penn family were proprietaries. Became independent in 1776, and in the Revolutionary war, as in previous wars, the "Blue Hen's chickens" (so called from their flag) were as brave and efficient soldiers as any. Constitution adopted Sept. 20, 1776, and others in 1792, 1831, and 1897; ratified the Constitution of the U. S. Dec. 7, 1787. The State has been quiet but prosperous. It held a few slaves till the civil war, and though it sent about 10,000 men into the Union army in the war, there was a large minority who then and afterward did not sympathize with the Union.

Governors of the State.—From 1776 to 1787, two governors of Pennsylvania, John Dickinson and Thomas McKean, were presidents of Delaware, but in 1789 the first Governor of Delaware was elected, and the succession has since been:

Joshua Clayton	1789–96	William Temple	1846
Gunning Bedford	1796–97	William Thorp	1846–51
Daniel Rogers	1797–98	William H. Ross	1851–55
Richard Bassett	1798–1801	Peter F. Causey	1855–59
James Sykes (acting)	1801–02	William Burton	1859–63
David Hall	1802–05	William Cannon	1863–65
Nathaniel Mitchell	1805–08	Gove Saulsbury	1865–69
George Truett	1808–11	James Ponder	1869–75
Joseph Haslett	1811–14	John P. Cochran	1875–79
Daniel Rodney	1814–17	John W. Hall	1879–83
John Clarke	1817–20	Charles C. Stockley	1883–87
Jacob Stout (acting)	1820–21	Benjamin T. Biggs	1887–91
John Collins	1821–22	Robert J. Reynolds	1891–95
Caleb Rodney (acting)	1822–23	Joshua H. Marvil *	1895–95
Joseph Haslett	1823–24	William T. Watson	1895–97
Samuel Paynter	1824–27	Ebe W. Tunnell	1897–1901
George Poindexter	1827–30	John Hunn	1901–
David Hazzard	1830–33		
Caleb P. Bennett	1833–37		
Cornelius P. Comegys	1837–40		
William B. Cooper	1840–44		
Thomas Stockton	1844–46		
Joseph Maul (acting)	1846		

* Died Apr. 8, 1895.

Delaware: city and railway center; capital of Delaware co., O. (for location of county, see map of Ohio, ref. 4–E); on the Olentangy river, 24 miles N. of Columbus. It is the seat of Ohio Wesleyan University and Ohio Wesleyan Female College. It has good schools, large railway repair-shops, 2 foundries, 2 flouring-mills, an oil-mill, a woolen factory, and manufactures of bagging, chairs, iron fences, carriages, lumber, etc. It is handsomely situated and well built. There are valuable medicinal springs here. Pop. (1880) 6,894; (1890) 8,224; (1900) 7,940.

Editor of "Gazette."

Delaware, or, more correctly, **Delawarr**, Thomas West, Lord: the twelfth baron of that title, the second governor and first captain-general of Virginia; a descendant by the female line of an old and noble family which derived its name, according to some authorities, from an estate called

La Warre (or Warwick), in Gloucestershire, England. He took his title in 1602. He was named captain-general of Virginia (which comprehended nearly all the present eastern coast of the U. S.) in a charter dated May 23, 1609. He visited the colony in 1610, established a post at the mouth of the James, built two forts, and returned in the following year to England. He expended large sums of money in establishing the colony of Virginia. He died at sea, "not without suspicion of poison," June 7, 1618, while on his second voyage to America. He appears to have been a noble and philanthropic man.

Delaware Bay: a wide estuary between the mouth of the Delaware river and the Atlantic Ocean, separating the State of Delaware from the southern part of New Jersey. The entrance between Capes May and Henlopen is 13 miles wide; the greatest breadth of the bay is about 25 miles. A safe and capacious harbor has been formed in this bay by the construction of a BREAKWATER (*q. v.*) near Lewes. This structure is in lat. 38° 59′ 07″ N., lon. 75° 6′ 9″ W. The western part of the bay is generally shallow, but it has a deep though not very direct channel for shipping.

Delaware City: a city of New Castle co., Del. (for location of county, see map of Delaware, ref. 2–N); on the Delaware river, about 40 miles below Philadelphia. It is the eastern terminus of the Chesapeake and Delaware Canal. Pop. (1880) 1,085; (1890) 969; (1900) 1,132.

Delawares: See ALGONQUIAN INDIANS.

Delaware Water Gap: a summer resort of Monroe co., Pa.; on the Delaware river, where it passes through the Kittatinny Mountain, and on the Delaware, Lackawanna and Western R. R.; 108 miles N. of Philadelphia and 92 miles W. of New York (for location of county, see map of Pennsylvania, ref. 4–J). The river here flows through a narrow gorge between steep rocky banks, which rise nearly 1,200 feet above the water.

De la Warr, EARLS, and Viscounts Cantalupe (Great Britain, 1761): Barons de la Warr (1209), Barons West (1343), Barons de la Warr (England, 1579, by patent).—CHARLES RICHARD SACKVILLE WEST, sixth earl, major-general, b. Nov. 13, 1815, succeeded his father, GEORGE JOHN, Feb. 23, 1869; d. Apr. 23, 1873; succeeded by his brother REGINALD WINDSOR SACKVILLE, b. Feb. 21, 1817.

Delcommune, ALEXANDRE: See the Appendix.

Del Credere Commission [*del credere* is Ital., and means of faith or belief]: in mercantile law, an additional premium charged by a factor or commission merchant on the price of goods consigned to him when he guarantees the solvency of the purchaser who buys them on credit. The *del credere* factor or agent is a surety, liable only to his principal in case of default on the part of the purchaser.

Delegation: the name formerly given in the Italian states of Lombardy and Venice and in the papal dominions to a province and its governor and his court. There were nine of these governing bodies in Lombardy and eight in Venice, each consisting of a delegate as president, a vice-president, and subordinates. In 1816 there were seventeen delegations established in the states of the Church, but the numbers were several times changed. Here the delegate was always a prelate appointed by the pope; if a cardinal, he was called a legate and his province a legation.

Delescluze *de-lā′klüz′*, LOUIS CHARLES: a French politician; b. in Dreux, Oct. 2, 1809; took part in 1830 in the republican movement; was, after the revolution of 1848, for a short time commissioner-general in the departments Du Nord and Pas-de-Calais; then published several ultra-radical papers in Paris; was in 1857 deported to Cayenne. In 1868 he started a journal, *Reveil*, which advocated the views of the International. During the reign of the Commune, of which he was the leading spirit, he was at the head of the war commission with almost unlimited powers. His fall, on May 28, 1871, on the barricade in the Rue d'Angoulême, ended the resistance of the Commune to the troops of the Government. He was accused unjustly of having issued the incendiary orders. He wrote *De Paris à Cayenne: Journal d'un Transporté* (1867), in which he described his sufferings during his exile.

Delft: a town of the Netherlands, province of South Holland; on the railway from Rotterdam to The Hague; 4 miles S. E. of the latter (see map of Holland and Belgium, ref. 6–E). It is well built of brick, and clean, and is situated amid a network of canals. It has a richly adorned townhall, a Gothic church containing a magnificent monument to William, Prince of Orange, who was assassinated here in 1584: a state arsenal, an East Indian college, a polytechnic, and several hospitals. Delft was formerly noted for glazed earthenware, which throughout Holland came to have the name of delft-ware. The same kind of pottery, now mostly made in England, is still called *delf*. Here are manufactures of carpets, woolen cloths, soap, etc. Pop. (1896) 32,021.

Delfts'haven: the port of Delft; on the river Meuse, 1½ miles S. W. of Rotterdam (see map of Holland and Belgium, ref. 6–E), and connected with the city by canal. It has a handsome church. The inhabitants are partly employed in ship-building, iron-foundries, and distilleries. Here the Pilgrim Fathers embarked for Southampton, July 22, 1620. Pop. 13,138.

Delgada, del-gaa′da, or **Ponta Delgada**: a city of the Azores; on the south side of the island of St. Michael; the capital of that island and of St. Mary; lat. 37° 45′ N., lon. 25° 40′ W. It has considerable trade in fruit, grain, and orchil. There are here a breakwater and docks for shipping. Pop. 17,940.

Delhi, or **Dehli**, dĕl′i: a division and district of the Punjaub, British India. The division forms the southeast angle of the Punjaub, on the west side of the Jumna river, with the Northwest Provinces on the E., and Rajputana on the S. It has an area of 15,530 sq. miles, and a population in 1891 of 4,433,680. The district is one of the subdivisions of the division, and is a strip of territory on the west bank of the Jumna, about 75 miles long and from 15 to 23 broad, lying between lats. 28° 13′ N. and 29° 13′ N., and containing the celebrated city of DELHI (*q. v.*): area, 1,276 sq. miles. It consists of a narrow, low-lying alluvial strip along the river, backed by a country of stony or hard sandy soil, which requires artificial irrigation. The chief products are wheat, barley, sugar-cane, cotton, and building-stone. The Rajputana state railway crosses the district, and the East India railway and the Punjaub railway run trains into Delhi city. Pop. 675,000. M. W. HARRINGTON.

Delhi, or **Dehli** (in Sanskrit, *Indraprastha*): a celebrated city of Hindustan, called by the Mohammedans **Shahjehanâbâd**: on the Jumna, 954 miles N. W. of Calcutta by rail; lat. 28° 40′ N., lon. 77° 18′ E. (see map of N. India, ref. 5–E). It was formerly the capital of the Mogul empire, and was the largest city of Hindustan, having a population of 2,000,000. An extensive tract, covered with the ruins of palaces, pavilions, baths, and mausoleums, marks the dimensions of the ancient metropolis. The modern city, mostly rebuilt by Shah Jehan 1638–58, has a circumference of 7 miles, and is surrounded on three sides by walls of red sandstone 30 feet high. It has ten colossal arched gates, defended by round bulwarks. The streets are mostly narrow, but one of the main avenues is 120 feet wide. The palace of the Great Mogul, built by Shah Jehan, is the most magnificent in India. Its stupendous towers, surmounted by elegant pavilions, its marble domes and gilded minarets, present a very imposing appearance. Among the other remarkable edifices is the Jamma mosque, a splendid structure in the Byzantine style, built of white marble and red sandstone. Delhi has about forty mosques, many of which have lofty minarets and gilded domes. The goldsmiths of Delhi are famous for the beauty of their work. Many Kashmir shawls are here embroidered with silk and gold. Delhi has a large trade in wheat and other produce. The city, which has been frequently captured by hostile armies, was taken by the British general Lord Lake in 1803, and it has continued under British domination ever since that time. In May, 1857, Delhi was occupied by the mutinous Sepoys, who here murdered a number of British residents. A British army commenced the siege of this place in June, and took it by assault, after a severe fight of seven days, in Sept., 1857. Pop. (1891) 192,579.

Delhi: village; capital of Delaware co., N. Y. (for location of county, see map of New York, ref. 6–H); on a branch of the N. Y., Ontario and Western Railway, and the west branch of Delaware river. It is the center of a grazing and butter-producing region, and has a foundry and various manufactories. Pop. (1880) 1,384; (1890) 1,564; (1900) 2,078.

Delibes, CLEMENT PHILLIBERT LEO: opera composer; b. at Saint-Germain-du-Val, France, Feb. 21, 1836; studied at the Paris Conservatory, taking first prize for solfeggio in 1850; accompanist at the Théâtre Lyrique in 1853 and at the Grand Opéra 1863, and second chorus-master under Massé. He was a chevalier of the Legion of Honor and a member

of the Institute. He succeeded Reber as Professor of Composition in the Conservatory. His most famous opera was *Lakmé*, produced in Paris in 1883 with the American singer Marie Van Zandt in the title *rôle*. Other works were *Coppelia*, 1870; *Sylvia*, 1876; *Le Roi l'a dit*, 1873; and *Jean de Nivelle*, 1880. These, and his ballets *La Source* and *Le Pas de Fleurs*, were very successful. D. Jan. 16, 1891. D. E. Hervey.

Delille, de-leel', Jacques, L'Abbé: didactic poet; b. at Aigueperse, Auvergne, France, June 22, 1738. He was educated at a college in Paris, and became Professor of Humanities at Amiens. His reputation was established by a translation of Vergil's *Georgics* (1769). In 1780 he published *Les Jardins*. He translated into French verse Vergil's *Æneid* (1804) and Milton's *Paradise Lost* (1805). His version of the *Æneid* is considered the best in the language. Among his works is a poem entitled *Imagination* (1806), which is highly commended. D. May 1, 1813. See Campenon, *Éloge de Delille*; Sainte-Beuve, *Portraits Littéraires* (vol. ii.).

Delirium [Lat. deriv. of *delira're*, to be beside one's self, liter., to leave the furrow; *de*, off + *lira*, furrow]: a condition in which the ideas of a sick person are in a confused, wild, or wandering state. It differs from insanity in being a symptom of acute disease, like fever, while insanity is an evidence of more chronic disease.

Delirium Tremens [Lat., trembling delirium]: one of the affections produced by chronic alcoholism. It occurs as a result of a protracted debauch in those habitually excessive in the use of alcoholic drink, more rarely as a result of a sudden withdrawal of the accustomed stimulus, or of a temporarily excessive indulgence. It is frequently caused by some severe injury in a drunkard, or by acute disease. Common as this condition now is, and must have been from earliest times, its cause and nature were not pointed out until 1813, when Dr. Sutton distinguished cases of delirium curable by opium, but not by blood-letting, from other forms of delirium, and in 1819 when Rayer showed the true nature and proposed the name *Oino-mania* (Gr. *οἶνος*, wine).

The symptoms of delirium tremens are varied, but the most important are wakefulness, loss of appetite, delirium, trembling, and hallucinations. Inability to sleep, combined with aversion from food and vomiting when such is taken, rapidly reduce the strength of the patient to an extreme degree. The trembling, so characteristic as to form part of the name, is invariable, usually affecting the hands, but in some cases general. The hallucinations generally pertain to sight, the objects seen being grotesque or horrible (only occasionally of a pleasant nature), and usually combined with most dreadful apprehension of impending evil. These symptoms continue and grow in severity until the patient is utterly exhausted, when death may ensue, or after longer or shorter intervals tardy restoration of health. Death occurs in about one-sixth of bad cases.

The treatment consists in supporting the strength of the patient by nourishing soft food, remedies being applied to the stomach to insure its retention; in inducing quiet and sleep by opium or morphia, bromide of potash, chloral, and similar drugs, together with utmost quiet of surroundings, and in attending to proper action of the emunctories. There is a constant craving for alcohol, but in most cases this is to be withheld. When weakness is marked, a little spirits may be allowed. Restraint with manacles and the like is not advisable when they may be dispensed with.

Delirium tremens is but one of the results of chronic alcoholism. An allied form, alcoholic mania or *mania a potu*, is a violent acute mania, and more often follows temporary excess in drink. In other cases, especially in drinkers of absinthe, which contains oil of wormwood, convulsions resembling those of epilepsy occur. But in general long-continued excess in drinking causes degenerative changes in all of the organs of the body, and therefore the symptoms are legion. William Pepper.

Delisle, de-leel', Guillaume: French geographer; b. in Paris, Feb. 28, 1675. He reformed the system of geography, and published in 1700 a map of the world and celestial and terrestrial globes. He wrote several memoirs on geography, and produced maps of ancient and modern countries. D. Jan. 25, 1726.—His brother, Joseph Nicholas Delisle (b. in Paris, Apr. 4, 1868), founded a school of astronomy at St. Petersburg, and wrote an account of the Russian search for a passage from the South Sea to the north of America. In Delisle s thermometer, used in Russia, the boiling-point of water is zero, and the freezing-point is 150°. D. in Paris Sept. 11, 1768.

Delitzsch, dā'litch: a town of Prussian Saxony; capital of a district, on the river Lober, and on the Magdeburg-Zerbst-Leipzig and the Halle-Suten Railways; 15 miles N. of Leipzig (see map of German Empire, ref. 4–F). It has four churches, a castle, and manufactures of woolen hosiery and gloves. Pop. (1890) 8,949.

Delitzsch, Franz: German theologian; b. in Leipzig Feb. 23, 1813. In 1846 he became Professor of Theology at Rostock, in 1850 at Erlangen, and in 1867 at Leipzig. In addition to numerous devotional and theological works, among which are *The House of God* (1848); *History of Jewish Poetry* (1836); *Biblico-Prophetic Theology* (1845); *Biblical Psychology* (1855); *Christian Apologetics* (1869); *A Day in Capernaum* (1871), he wrote valuable commentaries on Genesis, Isaiah, Psalms, Proverbs, Job, Song of Songs, and Hebrews. He moved steadily from a conservative position to an acceptance of the modern view of the composition of the Hexateuch. He prepared also a translation of the New Testament into Hebrew. He was one of the most esteemed and influential expositors of this century. D. in Leipzig, Mar. 4, 1890. Revised by C. H. Toy.

Delitzsch, Friedrich: son of Franz Delitzsch; b. in Erlangen, Sept. 3, 1850; Professor of Assyriology at Leipzig, and a leader in the younger school of German Assyriologists.

Delius, dā'lēe-oos, Nicolaus: German Shakspeare scholar; b. in Bremen, Sept. 19, 1813; studied at Bonn and Berlin; taught at Berlin; removed to Bonn in 1846, where, after holding other subordinate positions in the university, he was made full professor in 1867. His most important work is his *Shakspeare*, a critical text with explanatory notes, which was first published 1854–61, and has run through several editions. Of his other publications the following may be mentioned: *Maistre Wace's St. Nicolas* (1850); *Der Mythus von Wm. Shakspere* (1851); *Ungedruckte provenzalische Lieder* (1853); *Ueber das englische Theaterwesen zu Shakspere's Zeit* (1853); *Pseudo-Shakspere'sche Dramen* (5 parts, 1854–74); *Abhandlungen zu Shakspere* (1878). D. at Bonn, Nov. 18, 1888. G. L. Kittredge.

Del'la Crus'ca [Ital., of the bran, because the chief object of the organization was the purifying or sifting out of the bran from the language. The emblem of the society was a sieve]: the name of a celebrated academy founded at Florence in 1582 for the purpose of establishing a standard of the Italian tongue. This academy published a dictionary, which became an authority in relation to classical purity of language. The Della Cruscan Academy was afterward incorporated with the Florentine Academy (*q. v.*), but was revived early in the nineteenth century. See Academy.

Della Cruscan School: a group of affected English writers, which came into notice toward the end of the eighteenth century, and flourished for a brief period. A number of English residents at Florence published about 1785 a volume entitled *The Florence Miscellany*, and, finding their verses admired, assumed the name of Della Cruscans (see Della Crusca), and began to contribute to newspapers published in England. Their imitators became numerous in England, but William Gifford (*q. v.*) satirized the Della Cruscans so severely in his *Baviad* (1794) and *Mæviad* (1796) that the school was summarily killed. Among its lights were Mrs. Thrale Piozzi, Robert Merry, Bertie Greathead, and William Parsons.

Dello: a Florentine painter; b. 1372. His name seems to have been *Daniello* (or *Dello*) *Delli*. He first aimed at sculpture, but being obliged to make his living he turned his attention to designing and painting furniture. He continued at this for many years, and painted for John of Medicis all the furniture of one room. Donatello also helped him with his work. His fame spreading, he was called to Spain in the service of the king. He became rich and was knighted, after which he wished to return to his country; but envious people attacked him, and he was not allowed by the Signoria to wear the insignia of his knighthood. So he returned to Spain, where he died in 1421. W. J. S.

Delmar, Alexander: a political economist of Spanish extraction; b. in New York city, Aug. 9, 1836. He was editor of the *Social Science Review* 1864–66; organized the U. S. bureau of statistics, 1866, and was its director 1867–68. He has published, besides other works, *Gold Money and Paper Money* (1862); *Essays on Political Economy*

(1865); the *International Almanac* (1866); *What is Free Trade?* (1868); *Letter on the Finances* (1868); and *History of Money in Ancient Countries* (1884).

Delmonte y Tejada, del-mōn'tā-cĕ-tā-*k*haa'dăă, Antonio: Spanish-American author; b. at Santiago de los Caballeros, Santo Domingo, Sept. 29, 1783. He graduated in law at the University of Santo Domingo. In 1801 he fought against Toussaint Louverture. The increasing disturbances in Santo Domingo forced him to emigrate to Cuba, and he finally fixed his residence in Havana, where he occupied various government positions and practiced law. He wrote *Historia de Santo Domingo*, of which the first volume only was published (Havana, 1853). D. at Havana, Nov. 19, 1861.

Herbert H. Smith.

De Long, George Washington: lieutenant-commander U. S. navy; b. in New York, Aug. 22, 1844. He entered the U. S. Naval Academy in 1861, was graduated in 1865, and served in the Juniata on her trip to Greenland in 1873 in search of the Polaris. From that time it became his great desire to be placed at the head of an expedition of Arctic exploration, a duty for which he was well qualified. In Nov., 1873, he explained his views by letter to Mr. James Gordon Bennett, proprietor of the New York *Herald*, who had already considered the feasibility of such an expedition. The result of various conferences was the purchase, by Mr. Bennett, of the English bark-rigged, steam-yacht Pandora, of 420 tons, owned by Sir Allen Young. By special act of Congress she was allowed to sail under American colors, to take the name of Jeannette, and be navigated by officers of the U. S. navy, with all the rights, privileges, etc., of a Government vessel. The command was given to De Long, who sailed in her from San Francisco July 8, 1879, through Bering Strait in search of the north pole. On June 13, 1881, the Jeannette sunk, crushed by the ice, in lat. 77° 15′ N., lon. 155° 50′ E., and De Long, with a number of the party, perished on the banks of the delta of the Lena, in Siberia, in Oct., 1881. See *The Voyage of the Jeannette*, by Mrs. Emma De Long (Boston, 1884, 2 vols.); also *Our Lost Explorers* (Hartford, 1888).

Delorme, Philibert: architect; b. in Lyons, France, about 1500; one of the best French architects; after studying ancient art in Italy he returned to France in 1536 and did his utmost to revive Roman forms in architecture in lieu of Gothic. He worked for Henry II., being introduced at court by the Cardinal du Bellay. He built a part of the royal château at Fontainebleau, designed the châteaux of Anet and Meudon, and restored many royal houses. Catherine de Medici employed him upon the Tuileries, where he displayed all the resources of his genius in its decorations. He published a work entitled *A New Way of Building Well and with Economy*, in which he suggests the use for roof construction of planks of fir-wood, instead of the usual building-wood, to combine tightness, economy, and solidity. He obtained permission of the queen to try this when he erected at Monceaux a most costly edifice for the *jeu de paume*. The experiment was most successful. D. in 1577.

W. J. S.

Delort, de-lōr', Charles Édouard: genre-painter; b. in Nîmes, France, Jan. 4, 1814. Pupil of Gleyre and Gérôme; second-class medal, Salon, 1882; Legion of Honor 1889. His most important work is *Capture of the Dutch Fleet in 1794* (1882). D. Mar. 10, 1895. W. A. C.

De'los (in Gr. Δῆλος), also called **Orty'gia**: a small island in the Ægean Sea, belonging to the group of Cyclades; was celebrated in ancient times as the birthplace of Apollo and Diana. According to tradition, it was originally a floating island, and was rendered immovable by Jupiter, in order that it might be a place of refuge for Latona. It was the site of a famous temple and oracle of Apollo, and was the center of a great periodical festival in honor of him. In 426 B. C. Delos was purified by the Athenians, who removed all the tombs, and enacted a law to prevent it from being polluted by births or deaths. It was reputed one of the holiest places in Hellas. On the formation of the confederacy in 477 B. C., for the purpose of resisting the Persian invaders, Delos was chosen as the common treasury of the Greek allies. After the fall of Corinth (146 B. C.), Delos, which had a good harbor, was the center of an extensive commerce. Here was a town of the same name, which is now a mass of ruins. Shiploads of columns and other remains have been carried away to Venice and Constantinople. The island has an area of 32 sq. miles, consisting for the most part of barren rocks culminating in Mt. Cynthus, and is not inhabited.

Del'phi (in Gr. Δελφοί): an ancient town of Phocis, and one of the most celebrated places in the Hellenic world, on account of its oracle of Apollo. It was situated at the southern base of Mt. Parnassus, in the narrow vale of the Pleistus, amid sublime and beautiful scenery. It occupied the central area of a great natural theater or semicircular recess, partly inclosed by stupendous rocky barriers. The original or proper name of the oracle was *Pytho*. The name Delphi does not occur in the poems of Homer, who mentions that Agamemnon consulted the oracle at Pytho. The Pythian games were celebrated here every four years, the first celebration occurring in 586 B. C. Delphi became an opulent city and independent state, deriving its riches and importance from its oracle, which was the most famous of all the oracles. In the eighth century B. C. its reputation extended not only throughout Hellas, but also among foreign nations. Crœsus, King of Lydia, gave rich presents to the Pythian Apollo. The oracles were uttered by a female called Pythia, who sat on a tripod placed over the mouth of a cavern. She is said to have breathed an intoxicating exhalation of vapor which issued from this cavern or chasm and was supposed to inspire her with the gift of prophecy. The fountain of Castalia, issuing near the base of Parnassus, supplied holy water for the temple of Apollo, which was one of the largest and most beautiful in Greece, and had a front of Parian marble. In 480 B. C. Xerxes sent a detachment of his army to plunder this temple, which contained a large amount of treasure. As the Persians were climbing up the rugged path to the shrine, on a sudden thunder was heard to roll, the war-shout sounded from the temple of Athena, and two huge crags rolled down the mountain, crushing many to death. The surviving Persians were seized with a panic, and retreated without having effected their object. In 357 B. C. the Phocians seized the temple, and thus provoked the Sacred war, during which a portion of the treasures was expended in paying the troops of Phocis. Delphi was attacked in 279 B. C. by Brennus and an army of Gauls, who, it is said, were repulsed by the same supernatural agency as the Persians. The Delphic oracle was finally silenced by the Emperor Theodosius. The site of Delphi is occupied by the modern town of Castri or Kastri.

Delphi: city and railway junction; capital of Carroll co., Ind. (for location of county, see map of Indiana, ref. 4–D); on Wabash river and the Wabash and Eric Canal; has a fine court-house, paper-mills, planing-mills, extensive lime interests, and excellent water-power. Pop. (1880) 2,040; (1890) 1,923; (1900) 2,135. Editor of "Journal."

Del'phin Classics: an edition of the principal Latin classics for the use of the Dauphin of France, son of Louis XIV. (*in usum delphini*), at the suggestion of his tutor, the Duke de Montausier, and under superintendence of Bossuet and Huet, preceptors to the dauphin. The series comprised ultimately forty authors or titles. See Hallam, *Introduction to the History of Europe*, vol. iii., p. 247; Baillet, *Jugements de Savans*, vol. ii., p. 278.

Delphin'idæ [from Lat. *Delphinus*, a dolphin, the typical genus]: a family of toothed whales, having for its principal characters numerous teeth usually present in both jaws, a short symphysis to the mandible, no distinct lachrymals, bony sternal ribs, and a central, transverse, crescent-shaped blow-hole, with the concavity forward. This family contains the greater part of the cetaceans, both in species and individuals. They range in size from the grampus, or killer (*Orca gladiator*), to the porpoise, or puffing-pig (*Phocæna communis*). A few occur in fresh water, but the great majority are marine and inhabitants of the waters of the globe, except the very coldest. See Beluga, Blackfish, Dolphin, Grampus, Narwhal, and Porpoise. F. A. Lucas.

Delphin'ium [from Lat. *delphi'nus*, dolphin; so called from the resemblance of the nectary to the form of the dolphin]: a genus of poisonous herbs of the natural order *Ranunculaceæ*, commonly called larkspurs. The seeds of *Delphinium staphisagria* and *Delphinium consolida* have powerful cathartic properties, and the alkaloid (*delphinia*) is recommended for paralysis and rheumatism. Both the annual and perennial kinds are favorite garden flowers; the double rocket larkspurs are especially rich and varied in color, and resemble hyacinths in their regular clusters. The genus *Delphinium* is closely allied to the aco-

nites. Several species are natives of Europe, the U. S., and Mexico.

Delphi'nus [Lat., a dolphin]: a small but striking constellation visible in the south in September. Four of its stars form a lozenge commonly called Job's coffin.

Delphos: city and railway junction; Allen and Van Wert cos., O. (for location of counties, see map of Ohio, ref. 3–C); on the Miami Extension Canal, 45 miles E. of Fort Wayne. It has good water-power. Pop. (1880) 3,814; (1890) 4,516; (1900) 4,517.

Delpit, Albert: French author; b. in New Orleans, La., Jan. 30, 1849; educated at the College of St. Barbe, and at the Lycée of Bordeaux. In Jan., 1870, he received a prize for an *Éloge de Lamartine*. He served with distinction in the war with Prussia, and received the cross of the Legion of Honor Aug. 5, 1871. His first volume of verse, *l'Invasion* (1872), and a poem entitled *Le Repentir, ou Récit d'un curé de campagne* (1873), won Montyon prizes, and in 1880 the Academy awarded him the Vitet prize. He wrote many novels, e. g. *Les Compagnons du Roi*; *La Vengeresse*; *Jean Nu-Pieds*; *Le Mystère du Bas-Meudon*; *Les Fils de joie*; *Le Dernier Gentilhomme*; *La Famille Cavilié*; *Théresine*; *Disparu*, etc. A collection of his poems in the *Revue de Deux-Mondes* was published under the title *Les Dieux qu'on brise*. D. in Paris, Jan. 4, 1893. Benjamin B. Holmes.

Del Rio: town; capital of Val Verde co., Tex. (for location of county, see map of Texas, ref. 5–E); situated on So. Pac. R. R., 2 miles from Rio Grande river; has a public school, ice-factory, cotton-gins, water-works, electric lights, and graded streets. The town is the center of a system of irrigated farms, the water for which is supplied by a series of springs 2 miles from the town. There are here a medicinal well, and large unworked deposits of mineral paint. Pop. (1880) 50; (1890) 1,980; not returned separately in 1900.

Editor of "Record."

Delsarte, del'saart', François Alexandre Nicolas Chéri: musician and investigator; b. at Solesmes, France, Dec. 19, 1811. He was the son of a physician, but was early orphaned, and became a rag-picker in Paris; at the age of twelve he devised an original method of musical notation which attracted the attention of the musician Bambini, who adopted and educated him; he was admitted to the Conservatoire when fourteen, but owing to pernicious training his voice failed; forced to abandon the lyric stage, he became a teacher and an investigator. For about forty years he studied all phases of human nature and its expression, seeking a natural and scientific basis for all art, especially for oratorical, musical, and dramatic expression. Leading artists, orators, and philosophers sought his instruction. The King of Hanover conferred upon him the Hanoverian medal of arts and sciences, also the cross of a chevalier of the Guelph order. Fearing "unripe publicity," he would not permit the results of his researches to be published; the only records of his work are charts of his formulations and fragmentary writings. Although his philosophy lives mainly in tradition, it has become the acknowledged basis of the highest art-criticism and culture. D. in Paris, July 19, 1871. Emily M. Bishop.

Delsarte System: an analytical, educational, æsthetic study of man and of art based upon François Delsarte's statement: "There is in the world a universal formula, namely, the trinity, that may be applied to all sciences and to all things possible." Man has sensation, mind, and soul, or, a vital, mental, and an emotional nature, each distinct but not separable from the other two. Tones express the vital nature, words the mental, gestures the emotional; the trinity formula is again applied to each. The body whose activity manifests the passions, thoughts, emotions, consists of three great members that correspond with the inner spiritual essence. The limbs are the primary vital agent, the head the mental, the torso the emotional. Each agent is divided and subdivided into three: thus in the torso the abdominal zone is vital in expression, the lung zone mental, the heart zone emotional.

The Formula applied to Motion.—All movements from the center (the body) are eccentric or vital, all toward the center concentric or mental, all around the center centered or normal. The laws of opposition, succession, rhythm, altitude, force, direction, velocity, reaction are the principal ones governing bodily motion and expression.

In the U. S. this system has been popularized and developed into a broad culture, artistic and utilitarian. It has had influence on the plastic, graphic, decorative, literary, and histrionic arts, and been made practical by the application of its fundamental principles to health. Delsarte taught the philosophy of expression, and illustrated by facial and pantomimic series; from his teachings have been developed series of psychophysical exercises governed by the law of correspondence: "Every outward manifestation is the expression of an inner state." They consist of (1) relaxing movements for removing over-nervation and conserving vital energy; (2) energizing movements for directing the nerve-force; (3) æsthetic movements for harmonizing all of man's threefold powers—thus producing health, harmonious development, natural expression.

Emily M. Bishop.

Delta: the name originally applied to the triangular alluvial plain in the mouth of the Nile, from its resemblance to the Greek letter Δ (delta). (See Egypt, *Ancient*.) The name is now applied to any deposit of land-waste laid down by a river or stream at its mouth in a sea or lake. Deltas are stony when rapid streams descend from steep mountains into quiet waters; but the greater deltas of the world are formed by large rivers of gentle slope, whose detritus consists almost entirely of fine silt. Near their mouths such rivers give out distributary streams, diverging on either side, and thus spreading their silt over a deltoid area. On the delta of the Mississippi, such distributaries are called bayous. Deltas are generally very fertile, but their slow drainage and marshy surface often render them malarial, and their occupation is difficult from danger of flooding by overflow of the rivers or by invasion of high storm tides from the sea. The greater deltas of the world are those of the Mississippi, Mackenzie, Nile, Po, Ganges and Brahmaputra, and Hwang-ho. Deltas are wanting in rivers whose lower course has recently been submerged by depression of the land. See Estuary.

Fan deltas are gently sloping alluvial deposits formed where steep streams run from mountain gorges out upon more open valleys or lowlands, as along the foot of the mountains that inclose the desert plain of Great Salt Lake. When a steep side-stream joins a larger river of gentle slope, a fan delta may push the river against the opposite side of its valley, as on the Rhône above Lake Geneva; or occasionally even obstruct the river and form a lake, as in Lake Pepin on the upper Mississippi above the entrance of the Chippewa. Similar fan deltas are rapidly formed in the lower valleys when the upper mountain slopes are deforested, thus throwing much land waste into the streams, as in Savoy. They attain great size in arid regions, as in Southern California. See Rivers, Floods, and Plain.

W. M. Davis.

Delta: a territory of Venezuela; occupying the delta of the Orinoco river and extending southward along the coast to the boundary of English Guiana, claimed by Venezuela to be the Essequibo river. The western boundary N. of the Orinoco is the Cano Vagre or Manomo outlet of that river. S. of this river the western boundary is the Sierra Imataca, about 80 miles inland. England claims the most of the southern portion; area claimed by Venezuela, 25,347 sq. miles. The land is alluvial, generally heavily wooded, subject to overflow and malarial. Population almost exclusively Indian, whose dwellings are often in trees. Capital, Tucupita on the Manomo. M. W. H.

Delue, de-lük', Jean André, F. R. S: a Swiss geologist and natural philosopher; b. in Geneva, Feb. 8, 1727. He invented a portable barometer, and published in 1772 *Researches on the Modifications of the Atmosphere*. In 1773 he removed to England; was chosen a fellow of the Royal Society, and became reader to the queen. He published in 1778 *Letters, Physical and Moral, on the History of the Earth and Man*, in which he defended the cosmogony of the Bible, and ascribed the formation of the present continents to a great and violent revolution which occurred about 4,500 years ago. He wrote several other works in French. He became a professor in Göttingen in 1798, but subsequently returned to England, and died at Windsor, Nov. 7, 1817.

Deluge [O. Fr. *deluge*: Ital. *diluvio* < Lat. *diluvium*, flood; *di-*, apart + *lu'ere*, wash]: an inundation or overflow of land by water, a term especially applied to the flood in the time of Noah, an account of which is given in Genesis vi., vii., and viii. It is often estimated to have occurred B. C. 2516, but its date may have been much earlier. The Jewish narrative seems to have been drawn from a double

source—an Elohistic document extending the duration of the Flood to a whole solar year, and alluding to the legal distinction between clean and unclean, and a Jehovistic—but both sources agree in ascribing the Flood to the depravity of mankind, in the description of the rescue of Noah, and in the promise that a deluge shall never again take place. Traditions of the Flood occur in many countries. Among the more important of these is the Chaldæan account preserved in a fragment of Berosus, and somewhat resembling that given in the Bible. In many of its details it completely coincides with the biblical narrative; thus in the triple letting out of the birds. Otherwise it seems founded on cuneiform sources. Mr. George Smith published (1872), from the cuneiform inscriptions, a very remarkable account of the Flood, corresponding in many particulars with those of Moses and Berosus. It was found in the library of King Asshurbanipal, and dates from about 660 B. C. Sisit (Hasisadra), an old Chaldæan king, takes the place of the Xisuthros of Berosus and the Noah of Genesis. He describes the godlessness of the world, the divine command to build an ark, the coming of the Flood, etc. Bunsen states that no trace of Noah's deluge is found in the Chinese traditions, but missionaries, both Protestant and Roman Catholic, assert that the Chinese have a story remarkably like that contained in the Bible. The Mahâbhârata of the Hindus contains still another tradition of the same event. The ancient Mexicans and many other tribes of American Indians have similar accounts. The same is true of the ancient Phœnicians, Greeks, and many other nations, ancient and modern. The Egyptian monuments appear to have no account of a general flood.

It is now generally held by Christian scholars that the flood recorded in the Bible was local, and not universal. The language of the original account does not necessarily imply more than this.

Delusion: See INSANITY.

De Lutherbourg, PHILIP JAMES: French landscape painter; b. in Strassburg about 1735; d. in London, 1812. He was a pupil of Casanova; elected to the French Academy; removed to London 1771, where he painted decorations for the opera-house, becoming celebrated for mechanical constructions. He excelled in landscapes, battle-pieces, and sea views; he etched his own designs. C. H. T.

Delyannis, THÉODORE: Greek statesman; b. at Kalavryta in 1826; Minister for Foreign Affairs, 1863; associated with the so-called Economical ministry, 1877; represented Greece at the Berlin Congress and was Premier 1885–86, and again in 1890, on the downfall of the Tricoupis ministry; but on Mar. 1, 1892, was overthrown by Tricoupis, chiefly on account of his alleged incompetence in managing the finances. He was again Premier from Apr., 1895, to Apr., 1897.

Dema'des (in Gr. Δημάδης): an Athenian orator and demagogue, who was a violent opponent of Demosthenes. He was witty, eloquent, and profligate, and acquired great political influence. He fought against Philip of Macedon at Chæronea, 338 B. C., but afterward took a bribe from that king, and favored the interest of Philip and his son Alexander. He was put to death by order of Antipater (or Cassander) in 318 B. C.

Demand and Supply: See POLITICAL ECONOMY.

Demantoid: See GARNET.

Demarcation, or **Demarkation**: a line or boundary by which one object is separated or marked off from another; a limit ascertained and marked, or the act of ascertaining and marking a limit; the "dead line" between two armies. The "line of demarkation" is a name given especially to an imaginary north and south line drawn by Pope Alexander VI., 360 miles W. of the Azores, all newly discovered lands to the eastward being granted by him to Portugal and all westward to Spain (1494).

Demarest, DAVID D., D. D.: a minister of the Reformed (Dutch) Church; b. in Oradell, Bergen co., N. J., July 30, 1819. He was a graduate of Rutgers College (1837) and the New Brunswick Theological Seminary (1840). After pastorates in Reformed churches in Flatbush, N. Y., New Brunswick, N. J., and Hudson, N. Y., he became, in 1865, Professor of Pastoral Theology and Sacred Rhetoric in the New Brunswick Seminary, holding in connection with this other positions of trust and usefulness. D. June 21, 1898. He published *The Reformed Church in America* (New York, 1856; 4th ed. 1889); *The Liturgical Spirit and Features of the Reformed Church in America*, in *Centennial Discourses* (1876); *History of the Theological Seminary at New Brunswick* (in the centennial vol. of 1884); *The Huguenots on the Hackensack* (1886). WILLIS J. BEECHER.

Demarest, JOHN TERHUNE, D. D.: a minister of the Reformed (Dutch) Church; b. at Teaneck, N. J., Feb. 20, 1813; graduated at Rutgers College (1834) and New Brunswick Theological Seminary (1837). For more than twenty-five years he was pastor at New Prospect, N. J., and he has been emeritus pastor from 1885. During an interval in this pastorate, 1850–67, he was pastor at Minisink, principal of Harrisburg Academy, and pastor at Pascack. He has published *Exposition of the Efficient Cause of Regeneration* (New Brunswick, 1842); *Exposition of 1 Peter* (New York, 1851); *Commentary on 2 Peter* (1862); *Christocracy*, jointly with Dr. W. R. Gordon (1867; 2d ed. 1878); *Commentary on the Catholic Epistles* (1879).

WILLIS J. BEECHER.

Demavend': the highest mountain of Persia, about 45 miles N. E. of Teherân; is the culmination of the Elburz chain, which separates the low shores of the Caspian Sea from the high table-land of Persia. It has a conical form and a crater-shaped summit, and consists of eruptive rocks and ashes. Its height is 18,600 feet, as determined by a Russian Caspian survey. An Englishman (William T. Thompson) ascended to the top of Demavend in 1837. As it is a conspicuous object from the great trade-route between India and Western Asia, it is connected with the early Persian legends much as Etna is with those of the Greeks. Columns of smoke frequently ascend from its fissures.

Dem'bea, Tzana, or **Tana**: a lake of Abyssinia; in lat. 12° N. and lon. 37° 15′ E.; 40 miles long, and has an average width of 25 miles. It occupies part of a fertile plain, and is 6,108 feet above the level of the sea. The Blue Nile issues from this lake.

Deme, or **De'mos** [Gr. δῆμος, people]: one of the smaller divisions of the ancient Attic tribes. When Clisthenes broke up the four old Attic tribes into ten new ones, Herodotus states that he subdivided these into 100 demes, but as there is no other authority for such statement, and the number of demes was actually 173 or 174, different explanations have been attempted of the passage in Herodotus. The demes were local divisions, in the registers of which the citizens had to enroll their names for political and other purposes. These demes were named sometimes after places, sometimes after persons, and those of the same tribe were not always adjacent, but might be in quite different parts of Attica. They had each its own presiding officer (δήμαρχος), treasurer, and other officers, and its own assembly, in which the business of the deme was transacted. Lists of the names of the demes under their proper tribes are given by K. F. Hermann, *Griech. Alterth.*, Anhang iv.; by Leake, in his *Demes of Attica*; and by Müller, *Hist. Græc. Fragm.*, vol. ii., pp. 357–359.

Demen'tia [Lat. deriv. of *de'mens*, demented; *de*, off + *mens*, mind]: a form of insanity characterized by gradual extinction of all the mental powers. It is one of the most hopeless forms of mental disease. See INSANITY.

Demera'ra: river of British Guiana, rising in the Macarí Mountains and flowing northward to the Caribbean Sea; length about 350 miles. The lower portion is navigable for about 75 miles for large vessels, and above that small vessels ascend some distance farther to the Kaicoutshi rapids. This part of the river was originally lined with forest, but much of it is now under cultivation. The upper river flows through open lands, and is much obstructed. The Demerara has given its name to the most populous county of Guiana, and the term is applied loosely to the whole colony, and in particular to the capital, GEORGETOWN (*q. v.*). HERBERT H. SMITH.

Demesne, dĕe-meen′, or **Demain**: in law, originally that portion of the lands belonging to a lord which was held in his own occupation or reserved for his immediate use. Hence it is sometimes used to denote those parts of a manor which the lord has in his own hands. Copyhold estates are also considered demesnes, because the tenants are held to retain them only at the will of the lord. See DOMAIN.

Deme'ter: See CERES.

Deme'trius (Russian, *Dmitri*): Czar of Russia, usually called the FALSE DEMETRIUS. He pretended to be a son of Ivan IV., who at his death in 1584 left two sons, Feodor and Demetrius. The latter died probably in 1591. The False

Demetrius raised an army of Poles in 1603, invaded Russia, and defeated Boris in battle. He began to reign in Moscow in 1605, but his partiality to the Poles offended the Russians, who revolted and killed him May 28, 1606. He was succeeded by Basil III., or Shuisky. See also DEMETRIUS THE FALSE.

Deme'trius Phale'reus: Grecian orator and philosopher; b. at Phalerum in Attica about 345 B. C. He was a disciple of Theophrastus the philosopher. He was appointed governor of Athens by Cassander in 317 B. C., and held that office ten years. His administration was so prosperous and popular that the Athenians erected to him, it is said, 360 statues. He escaped to Egypt when Athens was taken by Demetrius Poliorcetes in the year 306. He was the author of many historical and philosophical works, which, with the exception of fragments, are not extant. D. in Egypt about 284 B. C. A rhetorical treatise *On Style* (*περὶ ἑρμηνείας*), which bears the name of Demetrius Phalereus, belongs in all probability to the first century B. C. It is to be found in Walz, *Rhetores Græci*, vol. ix., pp. 1–126, and Spengel, *Rhetores Græci*, vol. iii., pp. 259–328.

Revised by B. L. GILDERSLEEVE.

Demetrius Poliorce'tes (in Gr. *Δημήτριος Πολιορκητής*, i. e. Demetrius the besieger of cities): King of Macedon; b. about 338 B. C.; a son of Antigonus, King of Asia. He was surnamed Polioreetes, besieger of cities, on account of his success as a general. He fought for his father against Ptolemy of Egypt in Syria. In 306 B. C. he captured Athens from Cassander, and defeated Ptolemy in a naval battle near Cyprus. His remarkable successes caused him to be treated by the Athenians with disgraceful servility, even to the extent of raising altars to him as a god, and, it is said, of allowing him to dwell in the Parthenon as the guest of Minerva. He gave proof of superior military skill in a long siege of Rhodes, but he failed to take that city. After the death of Antigonus, and his own defeat at the battle of Ipsus in Phrygia (301 B. C.), he lost his possessions in Greece, but subsequently, on forming an alliance with Seleucus, regained them in part. He usurped the throne of Macedon in 294, but was driven out by Pyrrhus and Lysimachus, and finally was forced to surrender to his former ally, Seleueus, by whom he was held a prisoner till his death, about 286 B. C. See Plutarch, *Life of Demetrius*.

Demetrius of Su'nium: Cynic philosopher, who enjoyed a high reputation for correctness of life and firmness of principle. He lived at Rome under the emperors from Caligula to Domitian, and was the friend of Thraseas Pætus and of Seneca. Living with the greatest strictness himself, he did not hesitate to censure even those in high position, for which freedom of speech he was banished. He is probably the same philosopher as the Demetrius of Corinth mentioned by Philostratus, according to Ritter, who gives a summary of his doctrines in his *History of Philosophy*, vol. iv., p. 168, Eng. trans. He left no writings.

HENRY DRISLER.

Deme'trius So'ter (in Gr. *Δημήτριος Σωτήρ*, i. e. Demetrius the preserver; so called by the Babylonians because he freed them from their tyrants): King of Syria; b. about 185 B. C.; a son of Seleucus Philopator. He was a hostage at Rome when his father died in 175 B. C., and his uncle, Antiochus Epiphanes, obtained the throne. Having escaped from Rome in 161 he was proclaimed king by the Syrians. He waged war against the Maccabees. Syria was invaded by Alexander Balas, by whose army Demetrius was defeated and killed in 150 B. C. His son, Demetrius Nicator, eventually became King of Syria.

Demetrius the False: pretender to the throne of Russia; began to urge his claim in 1607. He affirmed that he was Demetrius, the son of Ivan IV., and was supported by many partisans. He was killed by a Tartar chief in 1610. For the first pretender, see DEMETRIUS.

Deme'trius Triclin'ius: Greek scholiast of the fifteenth century. He is known for a recension of the text of Sophocles which long served as a basis of subsequent revisions. He also composed scholia on Sophocles, first published by Turnebus in his edition, and two other works on the same poet, the one on the meters (*περὶ μέτρων*), the other on the figures (*περὶ σχημάτων*), which, however, are of no great value. He compiled scholia also on Hesiod, Pindar, and Aristophanes.

HENRY DRISLER.

Deme'trius Ze'nus: a writer of Zacynthus, who, about 1530 A. D., translated the *Batrachomyomachia* into modern Greek in the so-called *στίχοι πολιτικοί* (popular verses). This is printed in Ilgen's edition of the *Homeric Hymns*, pp. 123–139, with a Latin translation by M. Crusius. The best edition is that of Müllach, Berlin, 1837. He composed a poem in the same measure on Alexander the Great, printed at Venice, 1829.

Demidoff: a Russian noble family, distinguished for the possession of great wealth, and the devotion of it to works of practical benevolence. The founder of the family was NIKITA, b. 1665, who established the first iron-foundry in Siberia, and was ennobled by Peter the Great in 1720. NICOLAI, who fought against the Turks in 1789, raised and fitted out a regiment at his own expense when Napoleon invaded Russia, 1812, and became a count and a privy councilor; added rich gold and silver mines to the family estate. His son, ANATOLI, author and patron of learning, b. 1812, married the daughter of Jerome Bonaparte; wrote, in conjunction with several French authors and artists who accompanied him on his travels, *Voyage dans la Russie méridionale et la Crimée, par la Hongrie, Valachie et Moldavie* (4 vols., Paris, 1839–41). D. in Paris, 1870. F. M. COLBY.

Demi-gods (literally, half-gods): fabulous heroes of the Greek and Roman mythologies. They were sometimes deified heroes, and sometimes the offspring of a divinity and a mortal.

De Mille, JAMES: Canadian author; b. at St. John, N. B., in Aug., 1837, and graduated at Brown University in 1854. He was Professor of Classics at Acadia College 1860–65, and of History and Rhetoric at Dalhousie College 1865–80. Among his works are *Helene's Household* (New York, 1858); *Andy O'Hara* (1860); *The Soldier and the Spy* (1865); *The American Baron* (1870); *An Open Question* (1872); *The Living Link* (1874); *Treatise on Rhetoric* (1878). D. at Halifax, N. S., in 1880.

NEIL MACDONALD.

Demi-lune [Fr. *demi*, half (< Lat. *dimi'dius*) + *lune*, moon < Lat. *luna*; so called because it is somewhat crescent-shaped]: in fortification, an outwork constructed to cover the curtain and the shoulders of the bastions. It is composed of two faces and two flanks, the former being inclined at a salient angle toward the outside.

Deming: town and railway center (founded in 1881); Grant co., New Mexico (for location of county, see map of New Mexico, ref. 14–Q); has four churches, fine public schools, an extensive factory for the reduction of canaigre, or tannin plant, which is indigenous and abundant on the surrounding plain, and sampling-works. Deming is the center of a leading silver-producing region, and is surrounded by an immense cattle-range. Pop. (1890) 1,183; (1900) 1,341.

EDITOR OF "HEADLIGHT."

Demiur'gus, or **Dem'iurge** [Gr. *δημιουργός*, handicraftsman, artisan; a term applied in the Platonic philosophy to the Creator; *δήμιος*, public, pertaining to the people (*δῆμος*) + *ἔργον*, work]: a word originally applied to an artisan or workman; afterward used by Plato, and especially by the Neo-Platonists and the Gnostics, to designate the Creator of the world, who was conceived by the Gnostics to be inferior to the Supreme Deity. In their fantastic elaboration of the doctrine of emanation the demiurge generally denotes the principle which, by entering chaos, produced the world. The name was also given to the highest magistrates in some of the Grecian cities.

Demmin, dem-meen': a town of Prussia; in Pomerania; on the river Peene; about 75 miles W. N. W. of Stettin (see map of German Empire, ref. 2–G). It is very old and was formerly fortified, but its fortifications have been demolished. It has manufactures of machinery, bells, ironware, bricks, lime, hats, woolen and linen fabrics, hosiery, etc. Pop. (1890) 10,852.

Democe'des (in Gr. *Δημοκήδης*): Greek physician of Crotona; b. about 550 B. C. He was taken prisoner by the Persians, and carried to the court of Darius I., to whom he gave medical advice. The Queen Atossa, whose favor Democedes had gained, persuaded Darius to send him to Greece with a small party of Persians on a secret mission. Democedes escaped from them and returned to Crotona.

Democh'ares (in Gr. *Δημοχάρης*): Athenian orator; a nephew of Demosthenes; a leader of the anti-Macedonian party. He was banished about 295 B. C., but returned in 287 or 286, after which he rendered important service as minister of finance. D. after 280 B. C.

Dem'ocles (in Gr. Δημοκλῆς): Attic orator trained in the school of Theophrastus; a contemporary and opponent of DEMOCHARES (*q. v.*). He is believed to have left written orations, since Dionysius of Halicarnassus attributes to him an oration previously ascribed to Dinarchus. Dionysius and Suidas call him Democlides.

Democracy [Gr. δημοκρατία; δῆμος, people + κράτος, power]: government by the people; a state in which the people at large possess the whole sovereignty. There are but three clearly distinguishable methods of government—the monarchical, the aristocratic, and the democratic; that is to say, the rule of one, of a number, or of the whole. The prefixes despotic, hereditary, and elective merely describe varieties of the first; an oligarchy is only a particular kind of the second; and such terms as republic and commonwealth import little that is distinctive as to political structure. Of sovereignty in other forms there has been ample experience, but governments based exclusively upon the democratic principle, without any admixture of other elements, have not been known until a recent period on any considerable scale. But see Thomas Erskine May's *Democracy in Europe.*

Essential Principles of Democracy.—A pure or simple democracy deciding questions of policy by direct vote is perhaps competent to the exercise of supreme power in an independent state of slight extent; opinions concur in denouncing it as impracticable in a large one. The representative form may therefore be regarded as the only practicable method of administering government on the democratic principle. Consistently with it political power may be denied to some members of the state, who are nevertheless entitled to protection and such privileges as are suitable to their condition. Age, sex, or ascertained unfitness may form grounds of exclusion; so in respect to a distinct race very inferior in numbers, as, for instance, the whites of Haiti. The right to exclude criminals after their guilt has been ascertained is indispensable to the preservation of social order—and, practically, it may be aimed against a class, as in the known instance of certain polygamists—but it should never operate otherwise than upon the offending individual as a consequence of his personal delinquency. Even in this case pernicious opinions can not properly be held to impair the citizen-right, though foreigners known to entertain them may be denied naturalization or hospitality in any form. With this qualification it may be broadly asserted that democracy, as a principle, entitles each citizen, in common with every other, to an equal interest in the state. A government based upon it can acknowledge no conflicting interests among the people to be favored or opposed. All its legitimate ends are accomplished when public safety and individual liberty are maintained. Where the voice of the people is actually sovereign this must ever be the fact, for it is an irresistible deduction of reason that the supreme will never can intentionally enact a law which is not required, or, in other words, lay upon its own freedom any needless restraint. Hence the axiom that in a democracy every positive regulation, not actually indispensable to the public and general welfare, which restrains or even indirectly tends to restrain, individual liberty in any degree, however slight, so far violates the spirit of the constitution.

Democracy and Privileged Classes.—The existence of classes is the very essence of monarchy. Their interests are necessarily adverse—a circumstance enforcing upon the rulers a general activity in support of their pre-eminence. In states actually or approximately despotic standing armies and frequent wars are the forces for this purpose; where a nominal place is assigned to the democratic principle permanent political parties might serve in lieu of the soldier to uphold the political machinery, but in general they only supplement him. Thus in great monarchies the so-styled common people have always been oppressed by enormous establishments, military or naval, or both. These are easily justified to unreflecting observers on the score of necessity, for, aggressive wars by monarchs in furtherance of ambitious designs being of constant recurrence, armed organization for defense seems a requisite. War, with its inherent rapine and cruelty, is not, indeed, due to the crimes of any one monarch; but the fact remains patent that it is an evil founded in the principle of monarchy, and inseparable from it. The active and enterprising spirits of every clime and age have found seductive occupation in these war-establishments, and through their agency large portions of society have always been withdrawn from useful employments to feed upon the labor of the rest. (Compare Herbert Spencer's *Political Institutions*, chapters xvii., xviii., on the Militant and Industrial Types of Society.) The annals of government are consequently little else than a recital of the devices by which from the beginning every civil society has been preyed upon by its own official corps. This is easily effected wherever monarchy or aristocracy prevails. Democracy, being based upon absolute equality, admits of no governing class, nor of any interest adverse to the people in those who conduct the public business. But by artifice and irregular methods the latter may become a class, may grasp powers incompatible with the nature of the government, and may involve their country in all the evils incident to hereditary rule. Persecution for moral nonconformity may be from time to time practiced until resistance is provoked and a color afforded for war. To this condition the grandly patriotic spirit engendered by free institutions gives great force and breadth; the entire people at once rush to arms, and public debt is incurred at a pace twentyfold more rapid than would be tolerated under the cautiously regulated corruption of monarchies. These are abuses, and are deviations from the democratic principle.

Democracy in the U. S.—The founders of the U. S. recognized not only the ineptitude of monarchy and aristocracy, but the necessity of repressing in the newly conceived system their most conspicuous abuses. Standing armies were denounced as dangerous to liberty; wars for the extension of territory were regarded as unjust, foreign alliances as inexpedient, and public debt as mischievous; but, strangely enough, no barriers whatever were instituted against any of these practices. On the contrary, powers to introduce and foster the most dangerous of them were expressly delegated, in the name of the people, to their public agents. The natural ill-effects were foreseen; but they were deemed susceptible of being kept within endurable bounds. Monarchy and aristocracy were indeed effectually repudiated for the time. Neither could long exist without hereditary distinctions, nor could these be upheld where commerce in land was free, and inheritances were equally partible by compulsion or from social habit; so primogeniture and the accustomed contrivances for rendering estates permanently inalienable were extirpated. But the founders of the American Union invested the national government with most of the powers by which the few had oppressed the many in all previous times. The State governments were framed in the same way. The powers of government in common use, originally designed by the officeholding aristocracy to create or uphold their own interests against the governed mass, were all sanctioned. Under the vicious and unjust systems previously existing they were no doubt indispensable; they were therefore assumed to be necessary, even in a representative democracy. As the checks and balances of the mixed system existing in England had developed the best administration then known, it was thought that, monarchy and all hereditary distinctions being excluded, complexity would afford adequate preventives of official malversation. The same example induced a reliance upon the free action of political parties as a motive-power to keep the official counterchecks in healthy action. Obvious distinctions between the old and the new governments seem to have been overlooked. In the former permanently antagonistic interests were legalized, and so commingled in the political constitution as to induce and necessitate continual conflict as a duty. Each of the three estates was there obliged to maintain a constant contention with the others, in order to protect its own peculiar and rightful privileges; while in the U. S. there were to be no classes, no separate estates, and no peculiar privileges. Everything was reduced to the dead level of absolute equality; there was nothing fundamental that needed a check or required to be balanced. Oppression by a permanently privileged class had heretofore been the grievance of nations. Such a contradiction in terms, and apparently in fact, as oppression of the people by themselves was not anticipated; to their virtue and intelligence it was therefore committed to carry the experiment to its full fruition, with an admonitory warning that perpetual vigilance was the price of liberty. The extent to which popular vigilance could be kept in beneficial action was then a problem; in some respects it is still so.

The Tendency of Political Parties.—In a great and prosperous state the private interests of business or pleasure afford engrossing employments. Minds fully occupied with such subjects can not be at the same time employed on large conceptions of governmental policy and in devising plans for their execution. The wealthy are regardless of govern-

mental action, unless led to seek aid for their private enterprises through official favoritism. The necessary preoccupation of the citizens in their private affairs, not lack of judgment or intelligence, is the great impediment to wise and just administration in representative democracies. There is much injustice on both sides in the mutual criminations which disfigured the early debates of parties in the U. S. on this topic. It was never a fact that one party distrusted the popular judgment, or that the other relied upon it. All the leaders well knew that, as the political system was arranged, the people could never act directly on public affairs, and those leaders failed to devise an effectual method of securing in permanence the choice of desirable legislators. It is a delusion to suppose that in a representative democracy popular attention can be kept riveted on public affairs by the contentions of party. In mixed governments this may be possible. There antagonistical parties are supposed to be founded on conflicting ideas or principles expressed in intelligible maxims, and the original faith of each party, together with the social and political condition in which it originated, is consequently perpetuated in the same lines from generation to generation. It may thus acquire a fixed place in the mind and heart, and may become an active moral sentiment. In a representative democracy there is no legitimate basis for just and honorable antagonisms of this permanent character. As in the nature of things was inevitable, the so-called political parties have ever since been gradually losing their hold upon distinctive opinions, and tending to a unity of views and purposes in which principles have little part. With such a unity parties can be nothing more than bands of rival leaders, keeping on foot, and employed as their respective forces, bodies of traders in the business or occupation of manipulating the masses, the ballots, or the returns. A government carried on by such agencies must at last attain a worse perfection than any which could exist under monarchical forms. According to these the king and his nobles, as ruling officers, have a permanent interest in the state descendible to their heirs. For the protection of that inheritance and for the benefit of their posterity they will take some care of the state. In a representative democracy the officeholders of the hour are the rulers of the hour; their term is brief, and if corrupt they will, like the similarly situated pashas of Turkey, make haste to grow rich, for their positions are soon to be surrendered to others.

Abuse of Power by the Official Class.—It is not through parties contending for control of the government that the benefits of democracy can be realized. The principle itself must be placed beyond the power of such parties. Permanent barriers, like those devised against monarchy, must be introdueed, which shall absolutely restrain governmental agents—that is to say, the officeholders—from any action not indispensably necessary to the common weal. Public offices and employments must be thus rendered undesirable to the indolent and the avaricious. This safeguard can only be established by a representative democracy. Monarchical principles are directly opposed to such a condition of things, and wholly incompatible with it. Its practicability depends upon the question whether a persistently active and capable supervision of the ruling officeholder can be established among those who neither hold nor expect office—that is to say, among the burden-bearing multitude who support the official corps. In effect, and quite consciously too during advanced stages of political degradation, the organized class of office-seekers will actually become allies of the party in power. Their function is to perpetuate among the people a belief that a conflict concerning principles is ever going on. Through the ordinary revolutions of the political lottery such contestants divide between themselves, and alternately enjoy, all that through the forms of law can be wrung from the multitude. They have been known to concert in perfect harmony before elections the means of accomplishing a prearranged result. On public emergencies the heroic virtues do indeed exhibit themselves in acts of great disinterestedness, but there is very little of this spirit displayed while nations are in their normal condition. In an exceedingly small or greatly impoverished country the vices natural to rulers may, indeed, be without opportunities; but in a great and prosperous state there is no possible safeguard against robbery by those who control the machinery of government, if the machinery be in itself adequate to effect that object when pushed to its utmost capacity. Those who enact the laws and administer them will always promote their private interests at the public cost if vested with sufficient power. Such is human nature, no matter what form or name the government may adopt. Democracy accepts this as an indisputable truth, and, distrusting all rulers, it gives to none of them any power that can safely be withheld. The policy of instituting checks upon power unavoidably granted, though not to be absolutely repudiated, is of little value. Appointing one set of official persons to watch another is a bootless contrivance. The remedy really aggravates the disease; it fosters the primary evil of government—a multiplication of public agents. The watcher and the watched soon learn to co-operate for joint benefit in the work of deluding the mass, whom it is the interest of both to circumvent. The judiciary may form an exception. The ancient practice of assigning reasons for the judgment pronounced still exists, and the duty is regarded as unavoidable. This, with the institution of review on appeal, does afford a protection of some strength. Besides, for the honor of our common nature let it be said, as it is true, that the habitual study of justice tends to create a sincere love of it. The inherent vice of all governments is a tendency among the official rulers to devour the people's substance, and the only remedy is in a strict application of the democratic principle. All powers which can be dispensed with should be withheld from the government, and numerous vicious methods now in the highest favor should be suppressed. Permitting revenue or the means of defraying public expenditures to be drawn from duties, imposts, excises, loans, or any source whatever other than immediate taxation enables those who control the administration to conceal their waste of the people's wealth, and protects them from any effective supervision. Compelling them to procure all revenue from the last named source would obviate these evils.

Safeguards against Official Extravagance in the U. S.—In a democratic State of wide extent it is evident that the whole electoral body can not govern directly. Even were the electors composed only of the most learned and enlightened of the non-officeholders, they could afford neither the time nor leisure to govern directly by their own act, or to watch the machinery of government in its varied details, and by that sort of guardianship prevent abuse. They could not even study, in this extended sphere, the character and capacity of their representatives. To hope for any of these things were idle and visionary. There is only one thing that the mass can do to secure good government. Each citizen can for himself—and if suitably spurred to the duty he will—give attention to preventing levies upon his own private purse, made directly before his eyes by government officials. Because of this tendency of the human mind a supervisory spirit among taxpaying electors may be evoked. In great emergencies patriotic zeal may be relied upon, but the needs of everyday life can be supplied in no other way than by thus appealing to the common and constantly active impulses of mere individual self-interest. The difficulty of inducing the citizen to pay taxes directly must be admitted. The very quality of mind which is relied upon for thus controlling public expenditure, and consequent taxation, creates an aversion to this duty. The evil art of the politician who calls himself a statesman consists in perceiving and acting upon the absurd preference for being robbed extensively through the secret and unfelt instrumentality of duties, excises, and the like, rather than paying directly moderate exactions in the form of taxes. This weakness of the citizen forms the strength of those evil counselors who misgovern the State. It must be corrected or intolerable evils will ensue. In the action of Congress, of the State legislatures, and of the municipalities official extravagance has been fostered to a shocking extent by allowing these unfelt methods of raising revenue, borrowing money for long terms on the public credit being the most prominent. Unless the numerous governments intertwined in the American system can be checked in this career, the system itself must ere long perish. This can not be accomplished otherwise than by absolutely forbidding all methods of obtaining revenue or funds for outlay other than immediate taxation. Simple taxation must always be paid, in the first instance, by those who possess property. A policy which would draw directly at the moment of need, and from the pockets of this class, through the immediate agency of the taxgatherer, the whole supply for public expenditure, would keep its members, from a regard to their own private interests, under the pressure of a constant and potent stimulus to restrain injudicious enterprises in war or peace.

Effect of Public Debt.—The creation of public debt diminishes present drafts upon the people, as duties, excises, and the like expedients conceal them. Both, consequently, facilitate wars and needless public works. If every governmental outlay were immediately defrayed by the taxpayers, very different results would ensue. The most wary and influential of the citizens, instead of being tempted to foster expense, would find in the approach of the unwelcome taxgatherer a potent stimulus to labor for its prevention. The consequent diminution of government jobs would relieve from public employ the multitudes whom corrupt officials now drive to the polls as cattle to the shambles. The favoritism displayed in taxing all others for the means to confer a bounty upon manufacturers would likewise disappear. The obtaining of revenue by secret or unfelt methods, independently of its keeping up a costly and vicious establishment, is in itself a positive evil. A sensibly felt pressure, in the form of taxation, is an indispensable provocative to vigilance among the taxpaying electors.

Proper Limits of Legislation.—By means of general laws admitting of no favoritism or partiality all requisite facilities, through corporate forms or otherwise, should be afforded to individuals for conducting every description of lawful business. This should include banking, insurance, the establishing of roads, canals, docks, fairs, or markets, and the furnishing of supplies of every description. Under this head there is the greatest room for progress in effectively applying the democratic principle, so as to prevent any needless action by the government, or the employment of its officers in any affairs that experience might show could be safely committed to individuals as a business. Regulation by general laws being sufficient, no power should exist to create, repeal, or alter any private corporation. Monopolies and fraudulent or extortionate rivalries in trade should be alike prohibited, as well as all power of enacting private laws. A general structural law for each kind of civil division, say counties, towns, cities, and villages, should be adopted, subject to alteration only by amendments likewise general in their application. This would at once reduce the volume of statute law, simplify its form, conduce to its intelligibility, diminish litigation, and restrain corrupt practices. Under a system of which this affords a specimen, laws might become few, simple, and easily understood. There would not be seen in one single State of the Union a legislative body sitting for four months of each year, surrounded by a hired lobby, and engaged in confounding the courts and the people with 2,000 pages of additional legislation, most of it hurriedly passed during the last week of the session in such confusion and disorder that the clerks, if disposed, can make alterations in bills after their passage and before their formal engrossment or authentication as laws. Little progress has been made in the application of the democratic principle since its adoption. Few of the steps hitherto taken or as yet proposed by parties with that professed object are of a beneficial tendency. A State school system was deemed judicious, and had, in its early stages, a beneficial effect. It dispelled that low grade of ignorance which was the only evil under this head demanding strong measures. But in process of time the trading politician seized upon State education, and rendered it, to a considerable extent, another foster-parent of the jobbery and electioneering abuses incident to a loose administration. It is in some places enormously expensive, a means of official patronage, and a football to be tossed to and fro in factious contentions, involving at times a plain infraction of religious liberty. Religion can exist only as a conviction deeply seated in the individual mind, and it is believed to be essential in forming good citizens; yet from the variety of its forms non-interference with it by government is a fixed democratic dogma. Theoretically, there seems an inconsistency in these propositions, but practically they are found to harmonize. Religious convictions bring into full action the voluntary principle, and divine worship is nowhere more amply provided for than in the U. S. The differences of opinion constituting what is called sectarianism, apart from which religion is unknown, form the precise objection to governmental interference with religious worship hitherto relied upon. The statesman's assumed aid to either if it do not begin in actual obstruction is sure to end there.

Reforms needed in the U. S.—(*a*) *The Civil Service.*—There is room for the introduction of many real reforms. Short terms and frequent elections are no doubt necessary as to the chief executive and the legislative bodies. Due responsibility to the real sovereignty—i. e. the people—can not otherwise be maintained; but as to all other officers removals should be for cause only—that is to say, fault or incapacity. Rotation in respect to public agents of any kind is a mistake in doctrine. Faithful service and proved capacity are singular grounds of disqualification. It must be admitted, however, that no absolute right of the citizen is invaded by introducing certain limits to eligibility, and expediency may require it in respect to one office. Indeed, it can hardly be doubted that a long quarantine should be required between exercising military command and aspiring to the chief magistracy.

(*b*) *The Registration of Voters.*—To guard against fraud, registry laws are expedient in densely peopled districts. A considerable period should elapse between the registry and the vote, without allowing exceptions on account of intermediate changes in residence. The more fixed and permanent the elector's habits, the better his duties will be performed. No public interest is subserved by a multitudinous or floating constituency; it is enough if the electoral body be sufficiently large to secure efficient supervision in the choice of representatives. It would be expedient to exclude from the elective franchise all officers and employees receiving pay from the public, and vast benefits would result if severe penalties were decreed against any who should compel this class to contribute toward the expense of elections.

(*c*) *Conflicting State Laws.*—The Federal Government was designed as an organ of limited powers, yet it has exhibited ample capacity to crush or modify at will not only State institutions, but the States themselves. Practically considered, the latter exist merely by sufferance, holding, as it respects the essentials of political power, no higher relation to the central authority than towns or counties do to the States in which they are situated. As bulwarks of liberty or constitutional rights they are nearly if not entirely powerless. But while thus superannuated and rendered ineffectual for the high purposes of the founders, they exercise a power which tends to serious mischiefs. Through their conflicting legislation, enforced by independent judiciaries, they may ultimately derange the laws concerning trade, contracts, and some other subjects of general concern. By the identity of their language, moral ideas, and social habits, and by their essential proximity effected through railroads and telegraphs, the inhabitants of the U. S. have become commercially and socially one nation. Conflicting laws and a jarring jurisprudence among them should be prevented, if prevention be practicable. A court of ultimate appeal, as well from the State as from the Federal tribunals, composed of judges selected by the States, and neither subject to official interference nor possessing coercive machinery of its own, might preserve this desirable unity of jurisprudence throughout the whole country, and might also defend the autonomy of the States.

The course of reform suggested would eventually mature the democratic system by securing to all citizens the utmost measure of freedom, affording material progress every aid to its most perfect development which an equal and impartial Government can bestow, and terminating official misrule. Its aim is to break the scepter of the trading politician, and thus, at last, to establish liberty on the only reliable basis—a popular censorship on democratic principles, perpetually stimulated to its duty by the simple operation of intelligent self-interest.

The fullest treatment of the questions here outlined is found in Bryce's *American Commonwealth*. Compare De Tocqueville, *Democracy in America*; Stickney, *Democratic Government*; and an anonymous work, *Class Interests* (New York). See also Burgess, *Political Science and Constitutional Law*. Compare articles REPUBLIC, and SOVEREIGNTY.

Revised by A. T. HADLEY.

Democ'rates (in Gr. Δημοκράτης): a supposed Pythagorean philosopher (of whose personal life no notice has come down to us) under whose name a collection of moral sayings called the "Golden Maxims" (γνῶμαι χρυσαῖ) has come down to our time. These are written in the Ionic dialect, and are remarkable for their simple and correct character, which highly recommends them even to a modern reader. The author is otherwise unknown, and the age of the collection is not determined. They are printed along with the collection of DEMOPHILUS (*q. v.*).

Democrates: an Attic orator who lived in the time of Demosthenes, and was an opponent of the Macedonian

party. He is mentioned in the Decrees in the oration of Demosthenes, *De Corona*, as serving with Demosthenes on two embassies—the one to Philip to receive the oaths, the other to the Thebans to enlist them on the side of Athens against Philip.

Democratic Party: one of the two great political parties of the U. S. In studying its history the fact should be borne in mind that no party can be free throughout its career from apparent inconsistencies, in which its original characteristics will be for a time lost, and its genuine significance obscured by its temporary policy.

From the very nature of men opposing parties appear to be a necessity. Roughly speaking, there is a radical difference between those who prefer change, and those who are in favor of the existing order of things. The force which lies in the direction of progress and the conservatism which desires to preserve are always in opposition. By whatever name men choose to designate the voluntary organizations into which they array themselves, it may be laid down as a general proposition that there will always be found those who may be designated as progressive and those who may be called conservative.

Wherever there is any form of freedom political parties will be organized, and the two great divisions will be of those who believe that all powers spring from the people, and those who, in some form or other, believe that powers are inherent in those who are called to rule. These two lines of division—that between the radical and conservative, and that between those who believe in delegated and those who believe in inherent powers—can not always be parallel. The history of a party will be somewhat like the meanderings of a great river. The general direction will always be toward the ocean, but there will be frequent windings, some making very sharp horseshoe bends, so that the casual observer, studying only a particular period, will be wholly unable to understand the drift of the party or to comprehend its current.

The Theory of Government proclaimed in the Declaration of Independence.—The formation of the colonies in America necessarily produced difference of interests between these communities. There were also some differences in blood and religion, so that there never was a time when all the colonies were completely homogeneous, and in the nature of the case it was and always will be impossible that this should be. The climatic influences which have so potent and subtle a power will always create differences of interests between New England and the cotton States; between the wheat-growing States of the Northwest and the mineral regions of our mountain-ranges. There is an occult growth for which we can not entirely account, even under the same general conditions, as is demonstrated by the national peculiarities which can be instantly discovered as one crosses the imaginary lines in European countries. The institution of slavery itself had two distinct influences—one to compact those colonies in which it was profitable, the other to separate the colonies into two divisions. The difference in population and size between the colonies also raised troublesome questions, so that if there had been no division among the American colonies on the grave question of separation from the British empire, and they had attempted simply to form a union, it would have been a difficult and delicate matter; possibly it would not have been feasible except under the great enthusiasm and the eminent leaders which the Revolution produced. To secure national independence our forefathers were obliged to pass over those other questions which might have been impossible of mutual compromise and settlement.

To justify that revolution it was necessary to agree upon some theory of government, and that has never been so well expressed as in the Declaration of Independence. It has always been true that God created men in his own likeness; that from this necessarily resulted the truth that man as man was capable of self-government, and therefore was the equal of every other man, and therefore free; that these men when organized into communities ought to be equal in each community, and that each community ought to be free; that the only reason which justified the organization of society was the protection of its members in those inalienable rights which follow from freedom and equality. All powers, therefore, must be delegated powers, and the only basis upon which government could rest would be the consent of the governed. For the purpose of securing national independence those communities could unite with each other, so as to give to each the power of all and yet to preserve to each its freedom and equality. Upon this theory, proclaimed in the Declaration of Independence, the Continental Congress representing the thirteen colonies necessarily was recognized as having a principal from whom it received its powers, and in whose name it acted. That principal was primarily the thirteen colonies acting separately, but the power exercised in each colony by virtue of which these delegates were chosen was also a delegated power, being given by the people of each colony, and therefore the principal was the peoples of each colony respectively. In that Continental Congress and among those who were conspicuous in the war were men who received these opinions with grave questioning; they doubted whether liberty could be preserved under such institutions; they could not rid themselves of the old conception that in some form governments possessed their powers inherently. When it is remembered that for many centuries kings reigned and parliaments enacted laws by divine right, that for much the larger part of what we call the history of our race men ruled by virtue of authority not derived from those ruled; when we recall the struggle between Church and state, it is not strange that among the ablest of those patriots were men who adhered to these traditional opinions. A "strong" government was held to be necessary to preserve order, and a strong government meant one in which the rulers were practically without limitation, and where the people were without rights, having only privileges. Paternalism as used in the vernacular of to-day is simply another form of stating the old claim made by Church and king, by whatever name they might choose to call it, that the power and right to rule were not derived from the consent of the governed. Under this theory, of course, men were not citizens, but subjects; communities were not free and equal or autonomous; distinctions and privileges were of favor; taxation was a kingly prerogative, its extent, subject, and mode to be determined by kingly discretion; public moneys belonged to the public authorities, who were not trustees for its expenditure. Under this theory splendid empires were possible, and superb monuments of human progress created.

The Formation of Parties.—Even some of those who believed that power rested in the people and was delegated by them doubted the success of free institutions, except in communities comparatively restricted in territory and small in population; that law and order could not be maintained under free institutions over a wide extent of territory. They also believed in what was called the necessity of the homogeneity of peoples—that is, that, under any form of government except that of despotism, peoples of different races or religions could not successfully work out the experiment of freedom.

Out of these various conflicting views and out of the diverse interests of the colonies there necessarily grew the formation of parties, not with strict lines of accurate or logical division, and not with close and compact party organization. This division can be traced in the secret history of the Continental Congress; it appears very strikingly in the contest over the secret treaty offered by Spain and France by which it was proposed that the united colonies should reach only to the top of the Alleghany Mountains, and that all west of the Alleghanies should be divided between France and Spain, France to receive all north of the Ohio river and Spain all south. This was defeated largely by men like Jefferson and Patrick Henry, who believed entirely in the doctrines laid down in the Declaration of Independence and the practical results which would follow from those doctrines, and possibly the division of parties may be found as well at that point as at any subsequent period.

To acquire the western country became the passion of Henry, Jefferson, and that school of thinkers who believed that under a confederation somewhat loosely formed, but based upon the general principles set out above, a republic could be successfully established which would include the entire continent. The opposition of Henry to every step taken toward the formation and adoption of the Federal Constitution can be understood only upon the hypothesis that after 1780 he believed the Eastern States were willing, if not determined, to prevent the expansion of the republic toward the West, and that he was convinced that the success of the American experiment depended upon the acquisition of western territory. This also will explain much of the history of the contest over the Constitution.

The Jeffersonian Party.—The debates in the Constitu-

tional Convention and in the various State conventions called to ratify that Constitution, and in the pamphlets of the period, demonstrate that there was a division upon the general lines indicated herein, and that the Constitution was a compromise between these diverse opinions. Those who believed that it was not wise to form a centralized republic, who secured the ten amendments to the Constitution, and who construed the Constitution to mean only delegated powers, under the lead of Mr. Jefferson gradually formed themselves into a party. Its first platform may be said to be the letter of Mr. Jefferson to President Washington in which he laid down with great clearness the Jeffersonian construction of the Constitution as opposed to the Hamiltonian construction. Without having any compact organization, and therefore not being in the strict sense a party, those who shared these opinions carried their opposition to the administration of Gen. Washington to an extent sufficient to indicate that at his retirement from the presidency there would be an attempt to control the government in the interests of their opinions. Mr. Jefferson, who was a great party leader, accepted the Constitution with the ten amendments as a finality, and so construed it as to give vigor to the Federal Government, preserve the sovereignty and autonomy of the States, and secure the individual liberty of the people. The acts of the Federal party under the lead of John Adams, the passage of the Alien and Sedition laws, the known opposition of its leaders to the acquisition of western territory, gave to Mr. Jefferson and his followers great advantages.

The Resolutions of 1798-99.—Perhaps the first formal platform of any party were the Virginia and Kentucky resolutions of 1798—those in Virginia drawn by Mr. Madison, those passed by Kentucky approved by Mr. Jefferson, and drafted in part by him and in part by John Breckinridge, who offered them and drew up the additional resolutions passed by the Kentucky Legislature in 1799.

These resolutions were at the time, strange as it may seem, Union resolutions. They consolidated the Union. Kentucky had come to the conclusion that the Eastern States under the Federalist construction of the Constitution were inimical to her interests; that under their control Kentucky would never secure the free navigation of the Mississippi river; and that the larger States close to the Federal capital would dominate the republic. The growing sentiment that continued union with the Eastern States was not profitable, further aroused by the election of John Adams and the consequent refusal to annex Louisiana, would in all probability have led to an attempt to dismember the republic at the Alleghany Mountains; but if the construction put upon the Constitution by the resolutions of 1798 and 1799 was received as the proper construction, and the Federal Government should be controled thereby, then Kentucky was urgently desirous to strengthen her ties to the Federal union, and intensely loyal to it. The election of Mr. Jefferson upon this platform obliterated all desire in the West for separation and insured the loyalty of the entire West and Southwest. It created a national party based upon that construction of the Federal Constitution which secured to each State the control of its own affairs, which limited the general Government to Federal matters, and yet gave to the Federal Government the sovereign power of increasing the territory of the republic, and furnished hope of unlimited expansion.

The Louisiana Territory.—The acquisition of Louisiana territory was really the first great act of sovereignty performed by the republic. It practically destroyed the Federal party. It gave to the U. S. the capacity for growth, and was an inspiration of invincible prestige.

Whatever may have been the doubts of Mr. Jefferson as to the constitutionality of acquiring territory in the mode in which Louisiana was acquired, they were forever settled by the action of the republic, and from that day it may be considered as settled that we have the power to acquire territory without a constitutional amendment.

The Republican Party.—The decadence of the Federal party gave to its opponents opportunity to consolidate themselves upon the general principles laid down by Mr. Jefferson in his inaugural address.

If all people were free and equal, and all power rested in them, and the grants called the Constitution were wholly from them, it followed necessarily that those who were chosen to execute those duties were trustees for the people; that all burdens were to be distributed equally; that all benefits were to be impartially given; that no taxes could be imposed except for public purposes; that those who received these taxes were trustees of the people for their expenditure; that no expenditures could be justified except for public purposes. This would require an economical government, a strict account of the expenditure of public funds, constant reference to the Constitution to ascertain the grants and limitations contained therein, and upon any new question which might arise such a party would naturally decide according to these principles.

Under the lead of Mr. Jefferson the Democratic party, then called the Republican party, was organized, and all his and its utterances are precisely in this line—to the general Government a faithful allegiance and a loyal obedience within the limits of the Constitution; the careful and vigilant preservation to the States of their autonomy and independence in all matters not granted to the Federal authority; the equal and impartial rights and privileges of the common people; the careful and economic expenditure of public money; the just imposition of impartial taxation.

The Tendency to Free Trade.—From the beginning of the struggle of the Revolutionary war the tendency of those who afterward became Democrats, under the lead of Mr. Jefferson, was toward free trade. Free commerce with all nations was considered necessary for the growth of the country. In the Republican platform adopted at Philadelphia by the congressional caucus in 1800 the sixth plank was "Free commerce with all nations, political connection with none, and little or no diplomatic establishment." And this represented the almost unanimous opinion of those who called themselves Jeffersonian Republicans. This was not considered incompatible with a system of imposts on imports by which revenue was raised, because the Government had to be maintained by taxation; but it was looked upon as the object to be finally attained, and it grew out of the principles held to be fundamental. There is no right more sacred than that of free labor. It is perhaps the highest form which freedom can assume that a man shall have the right to labor for his daily bread and the support of those dependent upon him as to him shall seem best. Free labor necessarily carries with it free disposition of the product of his labor. It is illogical and absurd to say that a man may labor as he pleases, but he shall not dispose of the product of his labor as he pleases. The dollar earned is the laborer's dollar, to be spent where, how, and as he pleases, save so far as his conduct may injure others. It therefore was almost a necessary tenet of those who held these general views that a laborer may sell and buy in whatever market seems to him best, the limitation being that he should pay out of his labor his share of the public taxes, which might be levied upon that labor in the shape of imports into which it had been transmuted.

But the question of protection and protective tariffs was not made a party issue until long after this period, and did not become a divisive one until after the war of 1812. The right and power of the Government to lay imposts had been asserted for many generations in every part of the world, and it was not strange that it was accepted without much question or consideration by that generation of thinkers and statesmen. It must also be remembered that during the debates on these financial questions from 1815 to 1828 there were no party organizations in the present sense of those words. The destruction of the Federal party had become complete and the election of Mr. Monroe was practically unanimous, so that men of various opinions claimed to belong to the same organization. During this period began those divisions which resulted in the reformation of party lines under Gen. Jackson and Mr. Clay; and it would be a curious inquiry, if there were any mode of making it certain, what would have been the result of party organizations if Mr. Clay had in 1824 elected Gen. Jackson President instead of Mr. Adams, and Clay and Jackson had united in the same organization instead of becoming enemies.

The Election of Mr. Adams.—The election of Mr. Adams gave to Gen. Jackson and his followers a plea that public opinion had been disregarded; and, while that election was entirely legal according to the forms of law, it was held by the subsequent judgment of the American people to be in violation of the spirit of our institutions, and the election of Gen. Jackson was a declaration of the American people that public officers are public servants, to act each in his place within the limitations of the law, but in obedience to the ascertained public will; and that while it may not be illegal to do a certain act, in the lower sense of a violation of statutes, it may be unlawful in the higher sense of dis-

obedience to the ascertained public opinion. Those who would most probably have been intensely Jeffersonian in 1801 became Jacksonian in 1828 because of this plea. Divided as they were upon the financial questions of the day, and disapproving, as no doubt many of them did, the somewhat arbitrary conduct of Gen. Jackson, they yet adhered to him because he represented the conception that public opinion when once ascertained by an appeal to the prescribed forms enacted by law ought to be dominant; that the people as people are sovereign, and that all governmental authorities are agencies and not rulers.

The divisions upon financial questions were nearly parallel with this division upon the election of Mr. Adams. It was not unnatural that those who believed that the defeat of Gen. Jackson by the House of Representatives was an improper act should be restive under any system which gave to a national bank great powers, and which looked to the expenditure by the Federal Government of large sums of money for internal improvements, or which tended in any other way to increase the power of the Federal Government.

The Nullification Contest.—At the same time the contest between Jackson and Calhoun over the nullification resolutions of South Carolina demonstrated that the majority of the Democratic party adhered strongly to the policy of maintaining the Federal Government in all its vigor. South Carolina won that fight as to the practical results. The compromise measures adopted by Congress under the lead of Mr. Clay were practically a surrender to the claim of South Carolina. Morally Gen. Jackson achieved a notable triumph. He both revealed and intensified the sentiment of the country that the union of the States was extremely precious. From the election of Mr. Jefferson to 1832 that sentiment had increased. The war of 1812 had compacted the States, and the glory won by our navy had added to the national pride. The navy is our most national institution, and its triumphs were the common triumphs of the nation, and its victories gave strength to the belief that the union was in and of itself an inestimable blessing. This was also increased by the superb speeches of Daniel Webster in his famous debate with Mr. Hayne and by the fervent appeals of Mr. Clay, so that, while South Carolina obtained such modification of the tariff laws as she could honorably submit to, and her statesmen could claim that they had triumphed in the contest, the result of these debates and of Gen. Jackson's proclamation and action was to give fervor and almost universality to the union sentiment in the country.

Jackson's Leadership.—The leadership of Gen. Jackson secured for the Democratic party the legitimate succession to the Republican party, and gave to it the right to boast that it was the party of Jefferson as well as that of Jackson. He preserved intact the organization, he consolidated its thinkers, he made permanent its discipline. As Jefferson had been the greatest of political leaders in the wisdom of his policy, so Jackson was the greatest in the power of his discipline. Jefferson formed a party, it is true, and made it victorious and led it to the absolute destruction of its enemies, but it was a party of thinkers without much cohesion; Jackson organized it into a great army, a powerful and vigorous machine, made it capable of great victories and of withstanding, without loss of *morale*, equal disasters. Under his leadership every member of it became inspired with the desire not only to enforce policies, but to secure victory. From that day to this the Democratic party has never lost the *morale* of organization nor the power of self-discipline, and has survived defeats which would have destroyed any other organization known to the history of the U. S.

Organization and First Platform.—During Jackson's two administrations the Democratic party needed no platforms. It stood substantially upon his messages. Its principles were enunciated by him or his followers, and were fully understood by the people. It was not considered necessary to formulate party beliefs through party platforms. From 1828 to 1840 it may fairly be said that the Democratic party formulated no creed. Resolutions were passed by various public assemblies of Democrats; statements were made in various state papers, but the party in formal convention did not put out any creed, and yet there was no doubt or uncertainty in the minds of its members as to its principles or its policies; but in 1840 it became necessary for the party as a party to express in some open and formal way what its purposes, its principles, and its policies were, and the Democratic platform adopted at Baltimore on May 6, 1840, gives as clear a statement of its beliefs as has been made from the time of Jefferson, and is as follows:

Resolved, That the Federal Government is one of limited powers, derived solely from the Constitution, and the grants of power shown therein ought to be strictly construed by all the departments and agents of the Government, and that it is inexpedient and dangerous to exercise doubtful constitutional powers.

2. *Resolved*, That the Constitution does not confer upon the general Government the power to commence and carry on a general system of internal improvements.

3. *Resolved*, That the Constitution does not confer authority upon the Federal Government, directly or indirectly, to assume the debts of the several States, contracted for local internal improvements or other State purposes; nor would such assumption be just or expedient.

4. *Resolved*, That justice and sound policy forbid the Federal Government to foster one branch of industry to the detriment of another, or to cherish the interests of one portion to the injury of another portion of our common country; that every citizen and every section of our country has a right to demand and insist upon an equality of rights and privileges, and to complete and ample protection of persons and property from domestic violence or foreign aggression.

5. *Resolved*, That it is the duty of every branch of the Government to enforce and practice the most rigid economy in conducting our public affairs, and that no more revenue ought to be raised than is required to defray the necessary expenses of the Government.

6. *Resolved*, That Congress has no power to charter a U. S. bank; that we believe such an institution one of deadly hostility to the best interests of the country, dangerous to our republican institutions and the liberties of the people, and calculated to place the business of the country within the control of a concentrated money power and above the laws and the will of the people.

7. *Resolved*, That Congress has no power under the Constitution to interfere with or control the domestic institutions of the several States, and that such States are the sole and proper judges of everything pertaining to their own affairs not prohibited by the Constitution; that all efforts by abolitionists or others made to induce Congress to interfere with questions of slavery or to take incipient steps in relation thereto, are calculated to lead to the most alarming and dangerous consequences, and that all such efforts have an inevitable tendency to diminish the happiness of the people and endanger the stability and permanence of the Union, and ought not to be countenanced by any friend to our political institutions.

8. *Resolved*, That the separation of the moneys of the Government from banking institutions is indispensable for the safety of the funds of the Government and the rights of the people.

9. *Resolved*, That the liberal principles embodied by Jefferson in the Declaration of Independence and sanctioned in the Constitution, which makes ours the land of liberty and the asylum of the oppressed of every nation, have ever been cardinal principles in the Democratic faith; and every attempt to abridge the present privilege of becoming citizens and the owners of soil among us ought to be resisted with the same spirit which swept the alien and sedition laws from our statute-book.

Of these, the first, fourth, fifth, and ninth are the enunciation of general and permanent principles, the others relate to the practical issues then before the people for settlement; of these, slavery has been settled by the thirteenth, fourteenth, and fifteenth amendments; the system of internal improvements is too firmly rooted to be overturned; and the question of the national bank has assumed a wholly new and different aspect.

In all party platforms there must be these two elements—fundamental political principles and declarations as to practical living issues. As to the first, we may expect exact and clear statements; as to the latter, there will probably be compromise, concession, and possibly ambiguity.

The Annexation of Texas.—The defeat of Mr. Van Buren, the election of Gen. Harrison and his early death, the repudiation by Mr. Tyler of the policy of the Whig party, the extra session, the resignation of Mr. Clay from the Senate, and the difficulties with Mexico, produced a state of affairs in 1844 which ought to have given to the Whig party a triumph, and which probably would have done so but for the desire of the country to annex further territory. Mr. Clay and the

Whigs made the same mistake in 1844 which Adams and the Federalists made in 1801. There are always local and transitory causes which operate with permanent and deeper motives. Mr. Clay's position on the slavery question, his unfortunate Raleigh letter, the alleged frauds in the Plaquemine precinct of Louisiana, may have contributed to his defeat; but the intense desire of the American people to acquire more territory secured the election of Mr. Polk, which would have been impossible even with all these other causes if it had not been for the position of Mr. Clay and the Whigs upon the Texas question. And looking back upon that controversy, it can be asserted that no one now regrets the decision under which we obtained Texas and acquired the territory extending to the Pacific Ocean. That election was the real deathblow to the Whig party. It did not die at once, even as the Federal party did not disintegrate upon the defeat of Mr. Adams. It was enabled by a division in New York to elect Gen. Taylor in 1848; but the seeds of dissolution had been sown—the death of Gen. Taylor and the accession of Mr. Fillmore revealed that the Whig party was no longer a compact party, and the overwhelming defeat of Gen. Scott in 1852 practically put that party out of the active list of political combatants. Its leaders were as able and perhaps more eloquent, and certainly as patriotic, as the leaders of the Federal party, but like the Federal party it ceased to represent either the nationality of the republic or any great local interest. The South distrusted its loyalty on the slavery question, the North looked upon it with suspicion because of its disposition to compromise, and its failure to recognize the inevitable destiny of the country turned from it the younger generation.

The Walker Tariff.—The Democratic party under the lead of Mr. Polk achieved two notable victories—the successful termination of the war with Mexico and the passage of the Walker tariff bill, which was framed upon the general lines of Democratic policies as laid down in the first platform of 1800. Taxation is always an important public question. In times of peace it becomes the most important public question. It touches everybody; its burdens must be borne, and they may become very heavy; it can be so laid as to give vast advantages to certain interests; it can be the means of wide corruption; it involves every financial problem; it affects all industries; upon it men are forced to differ by reason of climate, product, and interest, who would otherwise agree upon principle. It is not, therefore, strange that at different periods, under different circumstances, with diverse leadership, there should have been inconsistent declarations or legislation which can not always be reconciled. But the Walker tariff may be held to be the practical crystallization of the general views which the Democratic party then held on the subject of raising revenue by imposts on imports, and the experiment was an eminently successful one, as shown by the action of all parties in 1856 and the legislation of 1857. The later claim that under that tariff our industries lagged and disasters occurred was a new discovery made after 1870, and is wholly inconsistent with the facts. The Democratic party in 1846–48 would seem to have entered upon a period of control as long as, and as absolute as, that upon which it entered in 1801. That it did not do so is wholly due to the institution of slavery.

The Slavery Question.—It is impossible to give a history of the institution of slavery in this article, but this much may be said: When the cargo of Africans was landed at Jamestown in 1619, prior to the landing of the Pilgrim Fathers in 1620, slavery was universally considered proper. It became legal in all the colonies. It was a local domestic institution recognized and legalized by each of the colonies. It was also recognized by the Constitution, and, in fact, a compromise was made by which the importation of slaves was made legitimate till 1808, upon the consideration that Congress should have the power to pass navigation laws—a contract effected by a union of certain maritime Northern States and Southern slaveholding States against the protest of the larger slaveholding States. The invention of the cotton-gin by Eli Whitney made slavery highly profitable. It was an institution which interwove itself in the domestic fabric of Southern civilization. The slaves were different in race and color from the masters, and the problem of gradual emancipation was one from which the Southern statesmen shrank. Many of the ablest men of Virginia, Maryland, Kentucky, and Tennessee, and other Southern States urged the adoption of some plan of gradual emancipation, and the majority of slaveholders were probably always in favor of some such system. It was defeated mainly because of the inability of the men of the South to make up their minds as to what could be done with the emancipated negro. They did not see how he could be deported, and they were not willing to make him a partner in their political control or an equal in their social life, and they shrank from the experiment of having so large a body of freemen who were held to be both politically and socially inferiors. Amalgamation was intolerable. And so the conservatism of preserving the existent order of things always prevented the adoption of any system of gradual emancipation. To these motives may be added the enormous value which the slaves represented. The South had bought and paid for them; to make the slaves freemen seemed to be an act of confiscation of the most cruel character, and to inflict the burden of compensation for them upon the non-slaveholding part of the community seemed to be equally cruel. So the slaves increased in number and in value, and the problem grew in danger and in difficulty. There was always a very wide anti-slavery sentiment in the North, and finally the Abolition party was organized, and became a factor in political matters. As a rule, the Democratic party, being in favor of the preservation of the power of the State over domestic institutions, rested upon the principle of Federal non-interference with slavery, and of remitting all questions concerning it to the various States. Mr. Clay, Mr. Calhoun, and others of various shades of opinion, saw that this could be only temporary. To postpone any national interference the policy of keeping the balance of power equal was adopted, so that with the admission of a free State a slave State should also be admitted, and the equality of power in the Senate be thereby maintained. Mr. Calhoun foresaw that the acquisition of territory under the treaty with Mexico would necessarily change the form of this problem and require congressional action, and he was indubitably correct. The compromise known as the Missouri Compromise could not be permanent, for it is in the nature of all compromises that they are only temporary. New and unexpected transactions produce new and unexpected complications, and each generation must solve its own problems for itself.

From 1801 to 1850 this question had entered constantly into political thought, but never in such a manner as to render it difficult of solution, but it constantly increased in gravity. The South became alarmed at the dangers which threatened it; it became sensitive to attack and anxious as to the final result. The mountainous character of so large a part of the South and the cheap prairie lands of the North made migration to the North so large as to render certain the loss of political power in the South. It took no acumen to calculate when the Northern States would greatly outvote the slaveholding States. Every day the disparity was becoming more apparent, and if division had to come, the sooner it could be brought about the more nearly equal the struggle would be. So the South turned readily to that party which stood by the guarantees of the Constitution, which denied any power of the Federal authorities unless granted in that instrument which it regarded as its sole barrier and its only hope. On this issue the Whig party in the South was practically destroyed, but the Democratic party in the North had a difficult if not impossible task to perform. As slavery existed in the District of Columbia, over which the U. S. had absolute control, as under the fugitive-slave law the authorities of the Northern States were often called to act, as there were territories over which Congress legislated, and which had to be organized into and admitted as States, it was impossible for the Federal Government not to concern itself with slavery; and the Northern Democrat had to face the question as to what his action would be concerning these questions, which were not within the domain of State action. He could well agree with his Southern brother that as to the institution in the States Congress could exercise no power, but he gradually ascertained that he could not agree as to what should be done on these other matters. To emancipate the slaves in the District of Columbia and to exclude them from the territories was practically to limit this institution so as to make it the victim of the increasing anti-slavery sentiment. Not to do this was held by the Northern States to require of them to become partners in the maintenance of the institution.

Slavery in the Territories.—When the question of the formation of territorial governments for the new territory acquired from Mexico and of the admission of California came up for decision, a division was inevitable. It was post-

poned by the compromise measures of 1850–51. It was apparently settled by the unprecedented victory of Gen. Pierce over Gen. Scott in 1852, but it is now clear that the division was inevitable. It may have been unwise in Mr. Douglas and those who urged him to do it to repeal, in form, the Missouri Compromise, and thereby to give the occasion for the formation of the anti-slavery party; but if this had not then been done the question would have had to be met in some form, and the same division would have occurred. The convention of 1856 adopted a compromise platform on this question which enabled the party to carry the election of that year; and if it had been wisely and ably led during the administration of Mr. Buchanan, it is probable that the division could have been postponed and some pacific solution of the problem ascertained. The requirement of the Southern Democracy that the territory should be looked upon as a common territory purchased by the joint contribution and acquired by the joint expenditure of blood, and therefore to be held for the joint benefit of all the States and of all the people, with the right of every citizen to carry his property into that common territory, was always a barren claim, and if admitted would never have made a single territory a slave State. The view of Mr. Douglas, known as "squatter sovereignty," however acute, was one which furnished no settlement, and the position of the Republican party that slavery was solely a local institution, and property in slaves purely statutory, and therefore not to be recognized beyond the territorial limits of the sovereignty whose statute created it, put in issue the entire question. The division of the Democratic party at Charleston was inevitable, and its division made the election of Mr. Lincoln certain. The war of secession destroyed slavery, overturned the State governments in eleven States, created a large public debt, and caused the issue of greenbacks.

The New Questions arising out of the War.—The new questions thus arising out of the war had to be met under unusual and peculiar circumstances. The Republican party was in control of every State of the Union except Kentucky, New Jersey, and Connecticut, and the exercise during the war of those powers which, for want of a better name, were called "war powers" had left in the hands of the President enormous power. To meet the expenses of the war had required in the judgment of those in control of Congress the issue of many millions of greenbacks, to which the quality of legal tender had been given, and the creation of a large public debt. The general Government had become necessarily interested in the financial affairs of the people. It had taxed out of existence the circulation of the State banks, and substituted for State banks a system of national banks. The Walker tariff had been repealed and the Morrill tariff enacted. The Democratic party at once, at its convention in 1868, took such position as was consistent with the principles upon which it was founded. As it had always believed in the equality and autonomy of the States, it declared for the "immediate restoration of all the States to their rights in the Union under the Constitution, and of civil government to the American people"; and "amnesty for all past political offenses, and the regulation of the elective franchise in the States by their citizens." Being utterly opposed to centralization in all its forms, it declared in favor of the payment of all the public debt as rapidly as practicable; and that all money drawn from the people by taxation, not requisite for the necessities of the Government economically administered, be honestly applied to such payment. Being committed to the equal distribution of burdens, it declared for equal taxation of every species of property according to its real value, and for one currency for the Government and the people and for every class of citizens. It committed itself to "economy in the administration of the Government; the reduction of the standing army and navy; . . . and a tariff for revenue upon foreign imports, and such equal taxation under the internal revenue laws as will afford incidental protection to domestic manufactures, and as will, without impairing the revenue, impose the least burden upon, and best promote and encourage, the great industrial interests of the country."

From 1865 to 1876 it vigorously and ceaselessly contended for the rehabilitation of the eleven States which had participated in the Confederate movement; for the restoration of every citizen to equal rights; for the removal of the army from those States; for the cessation of military government; for the payment of the public debt; and for a return to the former peaceful modes of government. During these years questions of taxation were not as important as they have since become, because the questions at issue involved the very nature of our institutions and the existence of State governments.

The Conventions of 1872.—In 1872 Greeley and Brown, having been nominated by the Liberal convention, were also nominated by the Democratic convention, not because it agreed with the views of these gentlemen upon the ordinary questions of taxation, but because they represented good government; the limitations of the Constitution in Federal matters; the restoration of the States to their autonomy; the subordination of military power to civil authority; and the equality of citizenship. Perhaps this aided the Democratic party to obtain the control of the House of Representatives in 1874 in the Forty-fourth Congress, and it exercised the power thus given to it by reform of abuses and the reduction of expenditures. Under the lead of Samuel J. Randall the Democratic House secured a reduction of over $30,000,000 of the annual expenditures of the Government, and at once restored to the House of Representatives its power over the public purse.

The Convention of 1876.—In 1876 at St. Louis the Democratic party in substance reaffirmed the platform of 1868, but in addition thereto demanded that all custom-house taxation should be only for revenue, and on that platform it claimed that Samuel J. Tilden and Thomas A. Hendricks were legally elected President and Vice-President of the U. S. The election being disputed, Congress, composed of a Republican Senate and a Democratic House, created the Electoral Commission which declared Mr. Hayes elected President, to which decision the Democratic party submitted. The result of that election at least was to cause the withdrawal of the Federal troops from the Southern States, and to restore to the three States of Louisiana, South Carolina, and Florida their autonomy; to put an end to Federal interference with the local affairs of the Southern States; to have in both branches of Congress a full representation from those States, which was soon followed by having that representation really elected by the people; and to enable the country to take up with more deliberation and less passion the economic questions which are now in process of discussion and settlement.

The Convention of 1880.—In 1880, at Cincinnati, the Democratic party was enabled to take position upon these economic questions with greater hope of union, and in that platform it expressed its general faith in these words:

"*Third.* Home rule, honest money, consisting of gold and silver, and paper convertible into coin on demand; the strict maintenance of public faith, State and national; and a tariff for revenue only; the subordination of the military to the civil power; and a general and thorough reform of the civil service."

The defeat of Gen. Hancock and the election of Mr. Garfield, followed by his untimely death and the unexpected succession of Mr. Arthur, led to the postponement of whatever reforms might otherwise have been possible; and the Republican party coming into possession of both branches of the Forty-seventh Congress, took advantage of having the President and Congress to revise all the tariff laws by the passage of the act of Mar., 1883. In the Forty-eighth Congress the Democratic party, though having control of the House of Representatives, found itself so divided on the question of taxation as to render any action on that question impossible.

The Convention of 1884.—The leader of the House, the Hon. William R. Morrison, chairman of the Ways and Means Committee, found himself overborne by the combination between the Republican party and the minority of the Democrats led by the Hon. Samuel J. Randall. This division of the Democratic party was carried into the convention which nominated Grover Cleveland and Thomas A. Hendricks at Chicago in 1884, and resulted in a compromise platform, the exact meaning of which has been the subject of great dispute, and which prevented the Democratic House of Representatives of the Forty-ninth Congress from passing a tariff bill. In 1887 the President, Mr. Cleveland, sent to the House of Representatives of the Fiftieth Congress his celebrated tariff message, in which he ranged himself with that wing of the party which had attempted legislation in the Forty-eighth and Forty-ninth Congresses, and which, though strong enough to elect its representative, the Hon. John G. Carlisle, of Kentucky, Speaker of both houses, had not been able to pass a tariff bill. After many months of deliberation and discussion, the House did enact a conservative Democratic bill known as the Mills Bill, from the Hon.

Roger Q. Mills, of Texas, leader of the House and chairman of the Ways and Means Committee.

The Convention of 1888.—At St. Louis, in 1888, the convention indorsed the Mills Bill and construed the platform of 1884 as contended for by the revenue Democrats, and nominated Grover Cleveland and Allen G. Thurman upon that platform. The defeat of Mr. Cleveland carried with it the defeat of the Democratic party in the House, and again the Republican party had possession of the presidency and both branches of Congress, and again took advantage of it to revise the tariff by the passage of the McKinley Bill, under the lead of the Hon. William McKinley, Jr., of Ohio, by which act the duties on such articles as were left dutiable were greatly increased; bounties were paid on sugar and other articles, and raw sugar made free. An attempt was made to pass an election bill which has become known to the country as "The Force Bill," and the Speaker, the Hon. Thomas B. Reed, of Maine, reversing the ruling of a hundred years, ruled that a quorum of those present and not voting could be counted for legislative purposes. This Congress also enacted what has become known as the Sherman law, by which it is made the duty of the Secretary of the Treasury to purchase monthly 4,500,000 oz. of silver, to issue therefor treasury notes, and with power to coin only so much of the silver as in the discretion of the Secretary may be necessary for the redemption of these notes. Upon these issues —1, the tariff; 2, the force bill; 3, the currency question; and 4, parliamentary liberty—the Democratic party appealed to the country, and secured the lower house of the Fifty-second Congress by an unprecedented majority, and upon the same issues nominated at Chicago Grover Cleveland for President, and Adlai E. Stevenson, of Illinois, for Vice-President.

The Election of Mr. Cleveland.—The nomination of Mr. Cleveland was, even if no platform had been adopted, equivalent to a pledge by the party that it would repeal the McKinley tariff act and substitute in its place a law imposing imposts upon imports upon the principle of raising revenue only, and that it would repeal the Sherman law and give to the country a sound and stable currency; it also pledged repose to the Southern States, and the repeal of all laws permitting improper Federal interference at the polls. The election of Mr. Cleveland by so large an electoral majority may be taken as a solemn declaration by the people of America that all interference by congressional legislation, or Federal authority, with elections in the States must cease; that from this time forth elections are to be controlled by the people resident within the several States. The battle for the equality and autonomy of the States may be considered as won, and the long contest for equal rights and privileges of the citizens, for the preservation of the power of the local authorities, and the security of home rule, may be considered as ended. This much the Democratic party may claim as its contribution to the peace, repose, and liberty of every State and every section.

The Sherman Law.—The repeal of the Sherman law must also be considered as promised. What shall be put in its place will be a matter of consideration and agreement by the Fifty-third Congress, which in both its branches has become Democratic under the verdict of the American people upon the issues submitted at the election of 1892. For the first time since Mar. 4, 1861, the President and Congress are Democratic; for the first time, therefore, can the Democratic party undertake to enact a statute, and for the first time can it be held responsible for legislation. It will take action upon the question of the currency, and settle it upon the principles announced in these various platforms, and probably never better than in that of 1880 in the words: "Honest money, consisting of gold and silver and paper, convertible into coin on demand." It declared in 1868, "for one currency for the Government and the people, the laborer and the officeholder, the pensioner and the soldier, the producer and the bondholder." These two declarations are equivalent, though in language they seem to be different. They mean that every dollar issued by the Government shall be equal to every other dollar, and shall be the equal of any dollar in any market in the world. This is in accordance with the fundamental principle of Democracy. As the agent of the people it must see to it that no dishonesty is practiced, and it follows that when it issues a dollar it has pledged that it is in fact and value a dollar, equal to every other dollar, and worth exactly what it professes to be worth. How, practically, this is to be carried out is a mere question of detail in statesmanship. There is no doubt that it will be successfully accomplished.

Taxation.—The same general remark can be made as to how the questions of taxation and the revenues of the Government will be met. They will be reduced within the limits of a fair and liberal economy. What are proper governmental expenditures will be answered in the light of the principle that no money shall be taken by taxation from the citizens except for such purposes as are enumerated within the Constitution, and only to such extent as is necessary to carry out those purposes. To meet these expenses revenue must be raised by taxation, and the bulk of this revenue must be raised first, by imposts on imports; second, by internal revenue from spirits and tobacco; third, the deficit, if any, must be made up by some form of internal taxation, either by an income tax or by increasing the subjects of taxation.

In laying imposts on imports the principle that it shall be for the purpose only of raising revenue will be kept steadily in view; but in framing a tariff bill certain practical principles must be observed to which the Democratic party is committed. In the Forty-ninth Congress, under the lead of the Hon. William R. Morrison, the Committee on Ways and Means reported a bill repealing all duties on raw wool. This committed the party to the principle "of free raw material." It may therefore be considered as settled that such material in its raw and crude state as can not be used except for the purpose of manufacture, and upon which further labor must be employed before it can go into consumption, will be admitted either entirely free of duty or with the lowest revenue tax; second, that on all articles only such duties will be laid as will produce a fair revenue, and that they will be laid for the purpose of producing revenue, and not for the purpose of protection; third, that the necessities of life will be admitted free. The principle involved in this is that he who makes a dollar shall have the control of that dollar, and shall purchase in such market as he chooses free from any other limitation than that of equal taxation to support the government which gives him protection.

The Democratic party has always been in its action a conservative party. It has never lacked caution. The reforms which it has pledged itself to accomplish will be done in a spirit of conservatism and caution. It will not destroy any industry which can live under fair and just competition; it will not make sudden changes, but will give fair and reasonable time for such necessary readjustment as modifications of the tax law may require.

The country is so rich, its products so enormous, the value thereof so great, the surplus which must be sold abroad so necessary to the maintenance of prices at home, that under a proper financial system it ought to be able to control the markets of the world. With proper amendments to our navigation laws by which our citizens can buy ships on precisely the same terms as citizens of other countries, we can regain the control of the sea; by removing all unnecessary barriers, taking off all improper burdens, and giving to American industry a fair market, we can control the markets of the world; and under a just and impartial taxation the income of America will be justly distributed among those who produce it.

Under the presidency of any Democrat who is a sincere believer in Democratic principles, and who will see to it that economy is practiced in all the departments, and that the civil service is fairly carried out, the expenditures can be greatly lessened; also under such a President who will require of public servants that they shall execute the duties of their office as if it were a public trust the revenues of the Government can be increased, and therefore the extinction of the public debt without an increase of taxation may be reasonably looked for.

This will divorce the Government from the financial operations of the citizen; it will limit the operations of the Treasury Department to its just functions—the collection and disbursement of the public revenue; it will also divorce the Government from the banking operations of its citizens, and limit the issues of its currency to the constitutional requirements.

With the autonomy of the States entirely recognized, with repose in every State, with equal taxation, with economic expenditure, with honest administration of the Goverment, the future of the republic will surpass the utmost flight of our hopes. WILLIAM C. P. BRECKINRIDGE.

Democ'ritus (in Gr. Δημόκριτος): a celebrated and profound Greek philosopher; b. at Abdera, in Thrace, about

460, or, some say, 469 B. C. He is supposed to have been a disciple of Leucippus, and to have received lessons from some Chaldæan magi. He inherited, it is said, from his father, a fortune of 100 talents. In early life he traveled in pursuit of knowledge in Egypt, Greece, Persia, and India, and continued his travels until he had spent nearly all his patrimony. Having returned to Abdera, he declined political honors and employment, preferring to pass his life in study and retirement. He had a high reputation for virtue as well as learning. He appears to have been versed in geometry, physics, natural history, and ethics, on which subjects he wrote numerous works, but none of them is now extant. According to the later biographers he was called the "laughing philosopher," from his habit of laughing at the follies of mankind. He was a man of noble, pure, and diligent life. It appears that he admitted the existence of law in nature, but not that of design. He died 357 B. C. His system is sometimes called the corpuscular philosophy. He taught that matter is eternal, and that the universe is composed of empty space and indivisible atoms which are infinite in number. To these atoms he attributes a primary motion, which brings them into contact and forms innumerable combinations, the result of which is seen in the multifarious productions and phenomena of nature. He imagined that the soul or thought is produced by the motion of round fiery atoms. Many of his ideas and theories were adopted by Epicurus, and explained by Lucretius in his poem *De Rerum Naturâ*. Of his works only the smallest fragments have been preserved. See Erdmann's *History of Philosophy*; Mullach, *Fragmenta Philos. Græc.*; Zeller's *Pre-Socratic Philos.* (vol. ii.).

Demod'ocus (in Gr. Δημόδοκος): the celebrated bard of the Phæacians; represented in the *Odyssey* as singing at the banquet of Alcinous, when he entertained Ulysses, the battles and the fate of the Greeks who went to Troy, with the conquest and destruction of that city, and also the loves of Mars and Venus. Later writers, who regarded him as an historical personage, represent him as an old and blind musician and poet of Coreyra, who composed a poem on the destruction of Troy (Ἰλίου ἄλωσις), and another on the loves of Mars and Venus.

De Mogeot, de-mō'zhō', Jacques Claude: author; b. in Paris, July 5, 1808; educated in seminary of St. Nicholas of Chardonnet; entered the University of Paris later; lecturer at Beauvais, Bordeaux, and Lyons; appointed to the chair of Rhetoric at the Lycée St. Louis at Paris 1843; author of *Les Lettres et les Hommes de Lettres au XIX^e^ Siècle* (1856); *Histoire de la Littérature française* (1857); *Tableau de la Littérature française au XVII^e^ Siècle* (1859); and *Histoire des Littératures étrangères* (1880). D. Jan. 9, 1894. C. H. Thurber.

Demogor'gon [from Gr. δαίμων, spirit, demon + Γοργώ, Gorgon, deriv. of γοργός, terrible]: a dreadful and mysterious being alluded to by some of the later classical writers, and by Boccaccio, Ariosto, Spenser, Milton, Shelley, and others. In Shelley's *Prometheus Unbound* he is the conqueror of Jupiter. The ancients dreaded the very mention of his name.

Demon, or **Dæmon** [from Gr. δαίμων, spirit, demon]: a term of Greek origin, used in classical writers primarily for the Supreme Divinity, sometimes as a synonym for θεός, a god, and later more especially as a tutelary or guardian divinity which was supposed to attend upon men. Thus Socrates is commonly said to have been attended by a beneficent dæmon. It may well be doubted, however, whether such an idea is justified by the language of Xenophon (see *Memorabilia*, i., 2, *et seq.*) or Plato (*Apol. Socr.*). Socrates appears to have meant simply that a divine influence or intimation of some kind within him, a sign or voice (σημεῖον, φωνή, in Plato), controlled his actions. (See Socrates.) According to Plato, "Every dæmon is a middle being between God and man." "Intercourse between gods and men is carried on by dæmons." He further says: "The poets speak excellently when they say that when good men die . . . they become dæmons." These ideas were greatly amplified by the Neo-Platonists, who divided the dæmons into good and bad. The dread of evil dæmons became so great that in time the word came to be almost always used in a bad sense. In the Greek New Testament evil spirits are often called dæmons (δαιμόνια, commonly translated devils), and Beelzebub is spoken of as the prince of dæmons (ὁ ἄρχων τῶν δαιμονίων). See Demonology.

Demon (in Gr. Δήμων): a Greek writer; author of an *Atthis*, or *History of Attica*; flourished about 280 B. C. His writings were regarded as of no great authority. He is also the author, according to Schneidewin and Müller, of a work on proverbs (περὶ παροιμιῶν). Of both these works some fragments still exist. Those of the proverbs have been inserted in the *Paræmiographi Græci* of Schneidewin and Leutsch, and all the extant remains have been collected by Siebelis, *Phanodemi, Demonis, etc.*, Ἀτθίδων *Fragm.* (Leipzig, 1802), and by Müller, *Hist. Græc. Fragm.*, vol. i., pp. 378–383.

Demo'nax (in Gr. Δημώναξ): Cynic philosopher who lived and taught at Athens in the second century A. D. His claim to distinction, however, is not so much that of a teacher of philosophy as of a model Cynic, and in this character he is depicted in Lucian's treatise called after his name. Though a native of Cyprus, he passed most of his life in Athens, where he was greatly honored while living, and when dead he was buried by the public with great magnificence. An outline of his doctrines will be found in Ritter's *History of Philosophy* (English translation), vol. iv., p. 169, and several of his apothegms are given in Orelli's *Opuscula Græc. vet. Sententiosa*, vol. ii., pp. 144, *seq.*

Demonetization: the removal of the legal-tender quality from money; in a more general sense, the destruction of its character as money. See Money.

Demonology [from Gr. δαίμων, spirit, demon + λόγος, word, reason]: the branch of the science of religion which relates to demons. (See Demon.) Belief in supernatural beings, neither divine nor human, yet affecting directly human beings for their weal or woe, seems to be universal and from the earliest times. Among savage nations evil demons play a prominent part. To them is attributed diseases and other misfortunes and calamities. Fear of them is the curse of heathenism and the exorcist is the great man, the "medicine" man of the savage. Among those a little higher in the scale of civilization the demon is still a dreaded being who can control a man to his loss and compass his death. So also in China, India, Japan, and among the Mohammedans sometimes, the demon plays comparatively harmless pranks, but usually he means mischief. Christian civilization is not entirely emancipated from belief in demons. The allegation of witchcraft among the Puritans of New England proves how persistent it is, for the alleged witches lived in the midst of a Christian civilization in many respects remarkable for its purity. Modern spiritualism is present-day proof of the same thing. It could never hold its place after repeated exposure as a delusion and a fraud if there were not belief in demons.

The question whether the cases of demoniacal possession mentioned in the New Testament are really such or only those which modern physicians would class under hysteria, epilepsy, lunacy, or the like, is frequently discussed. To the theological mind there is no difficulty in supposing that the demons (not "devils," as the Authorized Version calls them) really had permission to vex men in order that their powerlessness before Christ might be manifested, who at his word conquered them. He surely seems to have acted as if demoniacal possession was a fact. In Matt. iv. 24 a distinction is made between those who were possessed with demons and those who were lunatics. In Matt. viii. 32 the demons are declared to be numerous enough to enter into a herd of swine. So in many other passages.

It is not denied that the ancient Jews believed in demons. The law of Moses commanded to kill those who had familiar spirits (Lev. xx. 27), and it is said that Saul "put away those who had familiar spirits and the wizards out of the land" (1 Sam. xxviii. 3). His recourse to a witch proves his own belief in their existence. Much later is the story of the apocryphal book of Tobit with its similar testimony. Belief in demons passed over into the Christian Church. The lives of the saints have many a story of their appearance. They loved to tempt holy men and women. St. Anthony is a classic illustration. It was held as a dogma that every child born into the world was under the power of an evil spirit, and so the early Church used a regular formula of exorcism before the baptismal formula, and so do the present Roman and Greek Churches. The exorcists were one of the minor orders of clergy. They exercised their functions in connection with what are now called nervous diseases. They relied much upon the use of the name of Christ for expelling the evil spirits. The heathen world was by the early Fathers, and by the far later Christian missionaries, con-

sidered to be full of demons, and to their opposition the slow progress of the truth was attributed. Idolatry has frequently been represented as the worship of demons (e. g. 1 Cor. x. 20).

As might be expected there are stories innumerable about demons. Many of them are collected in such books as G. Roskoff's *Geschichte des Teufels* (2 vols., Leipzig, 1869); E. B. Tylor's *Primitive Culture* (2 vols., London, 1871); M. D. Conway's *Demonology and Devil-lore* (2 vols., London and New York, 1879). SAMUEL MACAULEY JACKSON.

Demonstration [from Lat. *demonstra're*, show forth]: an indubitable proof of a proposition; properly, a perfect proof, such as a mathematical one. The term was used by Aristotle and the older writers to signify any manner of showing either the connection of a conclusion with its premises or that of a phenomenon with its asserted cause; but it now signifies in philosophical language only that process by which a result is shown to be a necessary consequence of the premises from which it is asserted to follow. The word demonstration is also applied to an imperfect proof, yet of a nature such that no reasonable doubt is possible, as Kepler's proof that Mars moved in an ellipse.

DEMONSTRATION, in common language or in everyday speech, signifies an exhibition or display, generally of an oppositional character; and very often the word is applied in such a manner as to involve a slight censure or disapprobation.

Demoph'ilus (in Gr. Δημόφιλος): a philosopher of the new Pythagorean school, whose age is not certainly known. He was the author of a work entitled βίου θεραπεία, from which there is still extant a collection of moral precepts entitled γνωμικὰ ὁμοιώματα, which are edited, along with the *Golden Maxims* of Democrates, by Schier (Leipzig, 1754), and which are printed also in Orelli's *Opuscula Græco. vet. Sententiosa*, vol. i., p. 1, *seq.*

Demoph'oön, or **Dem'ophon** (in Gr. Δημοφόων, or Δημοφῶν): in Grecian mythology, a King of Athens; son of Theseus and Phædra, who is said to have accompanied the Greeks on their expedition against Troy, whence he rescued his grandmother Æthra. When Diomed, on his return from Troy with his Argives, ran in by night to the coast of Attica, and began to plunder it, Demophon attacked him and carried off the Palladium, or statue of Pallas. Demophon is said also to have assisted the Heraclidæ against Eurystheus, who was slain in the battle that took place, and to have received Orestes when, after his mother's murder, he sought refuge at Athens.

Demop'olis: city; Marengo co., Ala. (for location of county, see map of Alabama, ref. 5–B); on railway and Tombigbee river just below the mouth of Black Warrior; has a cotton compress, two large lumber-mills, oil-mills, an ice-factory, and an active trade in cotton and coal. Pop. (1880) 1,389; (1890) 1,898; (1900) 2,606.

EDITOR OF "NEWS."

De Mor'gan, AUGUSTUS: English mathematician; b. in Madura, Madras Presidency, in June, 1806; educated at Cambridge. He was for many years Professor of Mathematics in University College, London. He wrote numerous works, among which are *Elements of Algebra* (1835); an *Essay on Probabilities* (1838); and *Formal Logic, or the Calculus of Inference, Necessary and Probable* (1847), and contributed largely to the *Penny Cyclopædia*. D. Mar. 18, 1871.

Demos: See DEME.

Demos'thenes: the most illustrious of Greek orators; the son of Demosthenes, a well-to-do Athenian citizen, proprietor of a cutler's establishment and a chair-factory. Born in 383 (or 384) B. C., he lost his father before he was eight years old, and fell into the hands of unscrupulous guardians, who appropriated a large part of the fourteen talents ($14,000) which should have been husbanded for the heirs. Two years after reaching the legal age of eighteen Demosthenes, who by that time had been trained in law and rhetoric by ISÆUS (*q. v.*), brought suit against his guardians and won his case, which he pleaded in person, but recovered only a part of his property, so that he found himself obliged to mend his fortunes by following the profession of a speech-writer. He soon became a distinguished and successful advocate, and we have a number of speeches prepared by him for use in private suits from the guardian speeches just mentioned down to the year 345. In 359 he began the preparation of speeches to be used in public suits, and in 354 appeared in the case against Leptines and won his right to be considered a master. In 351—the date of the first Philippic—began his long struggle with Philip of Macedon. The first Philippic, in which Demosthenes uttered his call to arms, was followed in 349–8 by the Olynthiacs, three short speeches, which are marvels of condensed vigor. In the same twelvemonth with the Olynthiacs falls the speech against Meidias, who had assaulted Demosthenes while the orator was discharging a public function, but this speech, one of the most famous among the extant orations, was never delivered. In 346 Athens made the peace with Philip known as the peace of Philocrates, and Demosthenes was one of the ambassadors sent first to negotiate and then to ratify the treaty. The conduct of Æschines, who was a prominent member of the embassy, gave occasion to the famous speech "On the Malembassy" (περὶ παραπρεσβείας), with the reply of Æschines (344), both of them in their extant form diligently manipulated by their authors. To this period belong the second Philippic (344) and the third Philippic (341). Open war was declared in 340, and ended in the crushing defeat of Chæronea (338). Demosthenes took part in the battle, and shared the fortunes of the day. The cheap charge of cowardice did not affect either his position or his influence. He was chosen to deliver the funeral oration over the fallen, and was active (by personal superintendence and personal contributions) in furthering the work of repairing the walls of Athens. For this patriotic service Ctesiphon brought in a bill that Demosthenes should be publicly crowned. This proposal was made in 336, shortly before the death of Philip. Legal technicalities were interposed by Æschines, who brought against Ctesiphon a charge of unconstitutional legislation. The case dragged its slow length along, and did not come to trial until 330. Demosthenes triumphed, and Æschines did not receive the fifth part of the votes, and was forced to withdraw from the city. The *Speech on the Crown* is not only the culmination of Demosthenean eloquence, but outranks all speeches known to fame. After this achievement Demosthenes lived to be drawn into the disgraceful affair of HARPALUS (*q. v.*), lived to be banished from Athens in 324 on the charge of receiving bribes. In 323 the death of Alexander brought hope to Demosthenes, brought him restoration to Athens. But the hope was of brief duration. Athens fell into the hands of the Macedonians, and Demosthenes was condemned to death. He made his escape to the island of Calaurea, but was followed into the sanctuary of Poseidon by the emissaries of Antipater, from whom he escaped by taking a quick poison which he carried concealed on his person (322).

Of the sixty orations extant which bear the name of Demosthenes modern criticism has rejected a considerable number, but we have ample material for a study of his art in its higher lines. That art was not easily acquired, and there are many stories as to the painful processes by which Demosthenes won his way to perfect mastery. Nature was against him. He was of delicate constitution, his voice was poor and unmanageable, his articulation so bad that he could not pronounce, it was said, the first letter of the word rhetoric (his own art), and his manner was awkward. To remedy these defects he recited verses with pebbles in his mouth, declaimed while running, while walking uphill, while facing the noise of the waves, and gesticulated before a mirror. Hooted down and laughed down in the assembly, he did not despair. He took lessons of actors, and persevered until his delivery matched his thoughts, and became dramatic and impassioned—too dramatic and impassioned for his critics—so that the professional actor Æschines sneered at the rant of the amateur actor Demosthenes. But Demosthenes was an actor who had "to know his lines"; he had to be "part perfect," and seldom trusted himself to extempore speech, though even there he was brilliantly successful. He was first and last a student, and the story that he transcribed Thucydides eight times in order to steep himself in the style of the historian is of a piece with the current criticism that his speeches smelt of oil. He was a student first and last; and it is only the close student of the original that can appreciate the fineness of the texture. Vocabulary, syntax, order of words in reference to sound as well as to sense, periodology, rhythm—all these things that contribute so much to the total effect, so much to the "action" of oratory, are lost in translation. But the directness of his style, his manly contempt of ornament, "the lightning and the thunder" of his eloquence, illumining, terrifying, transfixing, the rush of a great personality which gives weight and cogency to argument, the inspiration of a

passionate patriotism—these are not all lost in modern renderings; and there is enough to justify the language of Brougham, who called Demosthenes "the first of orators, at the head of all the mighty masters of speech." His nature was austere, it is true; he lacked tenderness, he lacked playfulness; but there was little room for these in his public orations, and with the private speeches criticism has been too busy to allow full justice to the resources of this "Proteus" of orators, as Dionysius calls him.

For the period, see Grote's *History of Greece*, vol. xi., ch. lxxxvii.; Thirlwall's *History of Greece*; the exhaustive work of Arnold Schäfer, *Demosthenes und seine Zeit* (3 vols.; 2d ed. 1885–7). For the style, see Brougham, *Dissertation on the Eloquence of the Ancients* and Blass's *Attische Beredsamkeit*, vol. iii., and for an admirable account in brief compass of both statesman and orator, Butcher's *Demosthenes* (1881). The chief annotated edition of all the orations is that of Dindorf (9 vols., Oxford, 1846–51); critical editions by Bekker (1824), Sauppe (1843), Dindorf-Blass, in the Teubner collection. Among the best editions of single or select orations are those of Blass, Buttmann, Dissen, Rehdantz, Sandys, Shilleto, Vömel, Wayte, Weil, Westermann, Whiston, F. A. Wolf. English transl., by C. R. Kennedy (5 vols.), in the Bohn Library. B. L. GILDERSLEEVE.

Demosthenes: an Athenian general who acted a prominent part in the Peloponnesian war. He and Eurymedon jointly commanded an army sent in 413 B. C. to re-enforce Nicias at Syracuse. After the Athenians had been defeated he surrendered, and was put to death by the victors in 413 B. C.

Demot'ica (anc. *Didymotichos*): a town of European Turkey; in Adrianople province, on the river Maritza, 25 miles S. of Adrianople (see map of Turkey, ref. 4–D). It is defended by a citadel or castle, and has several Greek churches; also manufactures of silk and woolen goods and pottery. Here Charles XII. of Sweden lived in retirement after his defeat in the battle of Pultowa (1709). Pop. about 8,000.

Demotic or **Enchorial Writing**: a cursive or shorthand alphabet used in ancient Egypt. It was an abbreviation of the hieratic writing, which was itself an abridged form of the true hieroglyphics. Its remains are difficult to decipher. It began to come into use about the origin of the twenty-sixth dynasty (672–525 B. C.), and was still used in 200 A. D. It contained forty-two letters and forty-eight syllabic characters. It appears on the Rosetta Stone, and was extensively employed even in public documents. Remnants of this alphabet appear in the Coptic. See EGYPTIAN LANGUAGE AND LITERATURE.

Demurrage: in mercantile law, an allowance made to the master or owners of a ship by the merchant or freighter when he detains the ship in port beyond the time specified in the charter-party. It is usually stipulated in the charter-party or agreement that if delay occurs in loading or unloading the vessel, the merchant who charters and freights her shall pay a certain sum per diem for the extra time. The rule is that during the loading and unloading the merchant runs all the risk of interruptions, even from necessary and accidental causes. But no demurrage can be claimed for a delay caused by the detention of a ship by a public enemy, or for delay caused by the fault of the master, owners, or crew. The word *demurrage* is also employed to mean the delay itself. Revised by F. STURGES ALLEN.

Demurrer: in law, a suspension of action in a cause until the determination of some point by the court; distinguished from an ANSWER (*q. v.*). In a pleading in equity, as well as at law, it raises a question as to the sufficiency in law of the case as stated by the opposite party. There may also be a demurrer to evidence, on the ground that the testimony offered by a party in a cause is insufficient to maintain or overthrow the issue. Revised by F. STURGES ALLEN.

De Murska, de-moorsh'kăă, ILMA: opera-singer; b. in Pesth, Hungary, in 1844; taught singing in Paris and Vienna, and made her *début* in opera in Florence when nineteen years old. Appeared in London in 1865, and in New York in 1874, with great success. Her voice broke and she soon sank into obscurity and poverty, and died in Munich, Jan. 17, 1889. D. E. HERVEY.

Denain, de-năn': a town of France; department of Nord; on the Scheldt, and on a railway; 5 miles W. of Valenciennes (see map of France, ref. 2–G). It is in an extensive coal-field, and has iron-works and manufactures of beet-root sugar and brandy. Pop. (1896) 19,916.

Dena'rius [a Lat. term, from *deni*, ten]: a Roman silver coin; originally equal to ten asses; was first coined 269 B. C. Its weight varied at different periods, and its value was afterward equivalent to sixteen asses, or about sixteen cents of U. S. money. See AUREUS.

Denbigh, den'bē: capital of Denbighshire, Wales; in the Vale of Clwyd; 22 miles W. of Chester (see map of England and Wales, ref. 8–E). It stands on the sides and at the base of a steep limestone hill, crowned by the imposing ruins of a castle built in 1284, and has many handsome antique houses, an old parish church, an ancient chapel, an asylum for lunatics, a home for orphan girls, and manufactures of shoes and leather. Pop. 6,535.

Denbighshire: a county of North Wales; bounded N. by the Irish Sea and W. by the river Conway. Area, 664 sq. miles. The surface is mostly rugged and mountainous, but fertile and beautiful valleys occur. Coal, copper, iron, lead, limestone, and slate are found in this county. The chief towns are Denbigh, Wrexham, Abergele, Llangollen, and Ruthin. Pop. (1891) 118,979; (1901) 131,588.

Den'derah (anc. *Tentyra*, probably taken from *Tei n Athor*, abode of Athor): a town of Upper Egypt, near the left bank of the Nile; in lat. 26° 13′ N., lon. 32° 40′ E., and opposite Keneh. Here are the ruins of a celebrated temple dedicated to Athor, the Egyptian Venus. It is one of the best preserved of the ancient structures of Egypt. It has a portico supported by twenty-four columns. The chambers and passages, as well as the exterior walls, are ornamented with portraits, among which are those of Cleopatra and her son Cæsarion. There are also two other temples—one dedicated to Isis and the other called Typhonium, from the representation of Typhon on its columns. See EGYPT, ANCIENT.

Dendermon'de, or **Termon'de**: a fortified town of Belgium, in East Flanders: at the confluence of the Dender and the Scheldt, and on the railway from Mechlin to Ostend; 16 miles E. of Ghent (see map of Holland and Belgium, ref. 9–D). It has a town-house, and a very old church called Notre Dame; also manufactures of linens, cotton yarn, and beer. Pop. (1890) 9,298.

Dendrite [from Gr. δένδρον, tree + suffix *-ite*, used of minerals]: a peculiar mineral, containing internally, or having its surface covered with, filamentary forms resembling moss, ferns, trees, etc. Moss agate and Mocha stone are examples.

Dendro'bium [from Gr. δένδρον, tree + βίος, life; so called because they live on trees]: a genus of epiphytic orchids, mostly natives of the tropical parts of Asia and Australia. They have flowers of great beauty, sometimes also remarkable for grotesqueness of form or for fragrance.

Den'drolites [from Gr. δένδρον, tree + a corruption of λίθος, stone, under influence of suffix *-ite*]: petrifactions found in Secondary and coal formations. They consist of plants and fragments of trees, having, generally, nothing in common with those now growing in the same regions. They are mostly cycads, tree-ferns, conifers, etc.

Dendrology: See FORESTRY and NURSERY.

Den'drophis [from Gr. δένδρον, tree + ὄφις, serpent]: a genus of tree-snakes (*Dendrophidæ*) found in India and Australia. They are of moderate size, up to 4 feet in length, slender, and either of a green color, harmonizing with the leaves, or brightly marked in a manner suggestive of flowers. They feed on insects, tree-frogs, and birds. F. A. L.

D'Enghien: See ENGHIEN.

Dengler, FRANK: See the Appendix.

Dengue, deng'gā [Span. prudery, fastidiousness, subst. to *denegar*: Ital. *denegare*: Fr. *de'nier* < Lat. *denega're*, refuse; first used by the Span. of the West Indies as a presumed equivalent of Eng. *dandy*]: an epidemic, seldom fatal, disease, which has prevailed at different times in the southern parts of the U. S. and in the East and West Indies. It is called "dandy fever" or "dengue," which is a Spanish perversion of "dandy," from the stiff carriage of those affected. It is also called "break-bone fever." The symptoms are headache, fever, pain and swelling of the smaller joints, an eruption of the skin, and gouty pains which often cause lameness for a considerable time. The disease is certainly infectious, and has many characters which suggest a relation to influenza. It may be the same disease modified by the climates in which dengue occurs.

Revised by WILLIAM PEPPER.

Denham, Sir John: poet; b. in Dublin in 1615. He graduated at Trinity College, Cambridge, in 1634, and studied law. His principal works were *Sophy* (1641), a tragedy, and a poem entitled *Cooper's Hill* (1643). He was a royalist in the civil war, and fled to France in 1648, but returned in 1652 and was appointed surveyor-general of works and Knight of the Bath. D. in 1669, and was buried in Westminster Abbey.

Denina, dā-nee'năă, Giacommaria Carlo: historian; b. at Revello, in Piedmont, Italy, Feb. 28, 1731. He published *The Vicissitudes of Literature* (*Vicende della Letteratura*, 1760). His principal work is a *History of the Revolutions of Italy* (*Istoria delle Rivoluzioni d'Italia*, 3 vols., 1769–70). Having been invited by Frederick the Great, he removed to Berlin in 1782, where he wrote *Revolutions of Germany* (8 vols., Florence, 1804). In 1804 he was appointed by Napoleon imperial librarian at Paris. Among his works is a *History of Western Italy* (1809). D. in Paris, Dec. 5, 1813. See Carlo G. Reina, *Vita di C. Denina* (1820).

Denio, Hiram: See the Appendix.

Denis, de-nee', Jean Ferdinand: author; b. in Paris, Aug. 13, 1798. He traveled extensively in America from 1816 to 1821, and subsequently visited Spain and Portugal with the special object of studying the literature of those countries. In 1838 he was appointed librarian of the ministry of public instruction, a post which he left in 1841 to take that of conservator of the Ste.-Geneviève library; in 1865 he became administrator of the Ste.-Geneviève. He was an officer of the Legion of Honor. Denis wrote several descriptive and historical works on Brazil, Guiana, and the Platine states, and on Portuguese literature, as well as a series of historical novels and numerous articles for the *Nouvelle Biographie générale* and other cyclopædic works. Among his best-known books are *Précis de l'histoire littéraire du Portugal et du Brésil*; *Le Brésil* and *Le Portugal*, in the collection called *L'Univers pittoresque*; *Chroniques chevaleresques de l'Espagne et du Portugal*; and *Scènes de la nature sous le Tropique*. D. in Paris, Aug. 2, 1890.

Herbert H. Smith.

Denis, Saint (Lat. *Dionysius*): the patron saint of France and first Bishop of Paris. According to Gregory of Tours (540–594 A. D.), he was one of seven missionaries sent from Rome about 250 A. D. to preach the gospel to the Gauls, and after he had converted great multitudes suffered martyrdom probably in 272 under Valerian. His festival is on Oct. 9. The identity of St. Denis of Paris and Dionysius the Areopagite, was first maintained by Hilduin, Abbot of St.-Denis (834). Previous to that time all the ancient martyrologies of French origin distinguished them, celebrating the feast of the Areopagite on the 3d and that of the Bishop of Paris on Oct. 11. (See Tillemont, *Memoirs for Church History*, vol. xiv.) Their identity is no longer defended by any serious writer. Revised by J. J. Keane.

Denison: town; capital of Crawford co., Ia. (for location, see map of Iowa, ref. 5 D); situated on Chi. and N. W. R. R., and on Boyer river; 64 miles N. N. E. of Council Bluffs; has six churches, and is the seat of a normal college. Pop. (1880) 1,441; (1890) 1,782; (1900) 2,771.

Denison: city and important railway center; Grayson co., Tex. (for location of county, see map of Texas, ref. 2–I); has St. Xavier convent, a business college, good schools, ice-factory, meat-refrigerator, planing-mill, foundry, railroad machine-shops, water-works, etc. Pop. (1880) 3,975; (1890) 10,958; (1900) 11,807. Editor of "Herald."

Denison, Charles Wheeler: See the Appendix.

Denison, George Taylor: officer; b. in Toronto, Canada, Aug. 31, 1839; educated at Upper Canada College in that city. He was admitted to the bar in 1861; entered the militia, and was promoted to command of Governor-General's Bodyguard in 1866, and commanded outposts on Niagara river during the Fenian raid the same year. In 1872 and again in 1873 he was sent to Great Britain to represent Ontario in emigration matters; and in 1877 was appointed police magistrate of Toronto. His work, *History of Cavalry* (London, 1877), was awarded a prize of 5,000 rubles, offered by the Czar of Russia for the best work on the subject. Among his other works are *Manual of Outpost Duties* (Toronto, 1866) and *Modern Cavalry* (London, 1868).—His brother Frederick Charles, C. M. G., b. in Toronto, Nov. 22, 1846, was educated at Upper Canada College, and admitted to the bar in 1870. He served as orderly to Gen. Wolseley in the Red River expedition of 1870; went to Egypt in command of the Canadian *voyageurs* employed in the campaign for the relief of Gen. Gordon, and was made a C. M. G. for his services. He entered the Dominion Parliament in 1887, and was re-elected in 1891. A fellow of the Royal Society of England, and author of *Historical Record of the Governor-General's Body-guard*.

Denison, Mary Andrews: See the Appendix.

Denison University (formerly known as Granville College): an institution of learning established and located at Granville, Licking co., O., by a vote of the Ohio Baptist Education Society May, 1831. It was at first intended for a manual-labor school, and hence located on a 200-acre farm, 1½ miles W. of the town. As a manual-labor school it was, like most others of the time, a failure. It was incorporated by the Ohio Legislature Feb. 3, 1832, under the name of the Granville Literary and Theological Institution. The name was changed in 1845 to Granville College, and this again under the general law of Ohio was changed, June, 1856, to the name it now bears.

The buildings are four, containing dormitories and study-rooms for 178 students, besides a fine chapel, natural history room, two society halls and libraries, college library (with over 14,000 volumes), lecture-rooms, recitation-rooms, etc. The fourth building is for the library, and is called Doane Hall. It was the gift of W. H. Doane, Esq., of Cincinnati, and was completed in 1879. A fine science hall, costing $40,000, and an academy building, costing $30,000, are in process of erection. These buildings are the gift of E. J. Barney and W. H. Doane, respectively.

Five four-year courses are provided—classical, scientific, Latin philosophical, Greek philosophical, and literary. The preparatory department is called Granville Academy. It has 6 instructors and 122 students.

The board of instruction consists of twenty professors and five instructors. The number of students, including Shepardson College, is about 350. The fixed property of the university, in ground, buildings, etc., is estimated at $160,000; library and apparatus, $40,000; and the productive endowment is $420,000. Shepardson College for women, affiliated with Denison University, established 1887, occupies six buildings, and has an endowment of $100,000.

D. B. Purinton.

Denizen [O. Fr. *deinzein*, one within, as opposed to *forein*, one without; deriv. of *deins*, *dens* > Mod. Fr. *dans* < Lat. *de* + *intus*, from within]: in Great Britain, an alien who had received from the sovereign letters-patent to make him a British subject. He might take lands by purchase and devise, but could not take by inheritance. Since 1870, however, aliens can take and inherit lands the same as natural born subjects. A denizen can not be a member of the privy council or of either House of Parliament, and can not hold any office of trust, civil or military.

Revised by F. Sturges Allen.

Deniz'li, or **Degnizli**: a town of Asia Minor; in Anatolia; 53 miles S. E. of Alashehr (see map of Turkey, ref. 5–E). It is surrounded by mountains or hills, and has a castle and several mosques. Leather is made here. It is stated that 12,000 of its inhabitants were killed by an earthquake in 1715. Pop. about 20,000.

Denman, Herbert: figure-painter; b. in Brooklyn, N. Y., June 20, 1855. Pupil of Art Students League, New York, and Carolus-Duran, Paris; honorable mention, Paris Salon, 1886, and Paris Exposition, 1889; member Society of American Artists 1887. His work, which is sometimes decorative in character, is marked by good qualities of color and drawing. One of the best of his works is *The Trio*, exhibited at the Salon of 1886, and representing three young women with musical instruments. Studio in New York. W. A. C.

Denman, Thomas, First Lord Denman: an English judge; b. in London, Feb. 23, 1779. He was called to the bar in 1806, and elected to Parliament in 1818. In politics he was a Liberal. He became Attorney-General in 1830, and chief justice of the king's bench in 1832. In 1834 he was raised to the peerage. D. Sept. 22, 1854.

Denmark: a kingdom of Northern Europe; consisting of the peninsula of Jutland and several adjacent islands of the Baltic Sea—viz., Seeland, Fünen, Falster, Laaland, Samsöe, Bornholm, Langeland, and Möen, together with the Faroe islands. Area, 15,289 sq. miles. Pop. (1890) 2,185,335. Besides Denmark proper, the Danish monarchy possesses Greenland, Iceland, and the West India islands of

Santa Cruz, St. Thomas, and St. John. Area of the colonies, 75,115 sq. miles. Pop. (1890) 127,184. Jutland is bounded on the N. by the Skager-Rack, on the E. by the Cattegat, and on the W. by the North Sea. Its surface is low and level, the highest elevation, Himmelbjerget (the Mountain of Heaven), being only 565 feet, and was formerly covered by forests of beech, birch, oak, etc. The eastern coasts are indented with numerous bays or *fiords*, while the western are lined with a double row of sand-banks, behind which extensive marshes occur in various parts. Denmark has no considerable river. Seeland is separated from Sweden by the Sound, and from the island of Fünen by a channel called the Great Belt.

Climate, Soil, etc.—The climate is humid, and is modified by the proximity of the sea, so that the winter is milder than that of Northern Germany. The mean annual temperature is about 46° F. The weather is changeable, but the transition from winter to summer is slower than in most other countries. In spring and summer the west wind prevails. The soil is generally productive, either alluvial or sandy. The marshy districts produce good pasture. Denmark is pre-eminently an agricultural country. The staple productions are barley, oats, wheat, rye, buckwheat, potatoes, beans, pease, and flax. The Danish farmers, however, derive a large part of their revenue from cattle, horses, and the products of the dairy. The chief articles of export are cereal grains, butter, horses, hides, and fish. The fiords abound in cod, herring, and other fish. As Denmark has no coal, nor any other mineral resources, its manufacturing industry is comparatively unimportant. There, are, however, in the kingdom numerous iron-foundries, sugar-refineries, paper-mills, and distilleries. and Danish furniture, porcelain, gloves, articles of horn, bone. and ivory, etc., are celebrated.

Commerce, Revenue, etc.—The commerce of Denmark is carried on mainly with Great Britain, Germany, and Sweden. The total value of imports amounted in 1898 to 462,219,000 kroner (137,701,000 kroner from Germany, 97,187,000 kroner from Great Britain); that of the exports amounted to 326,-361,000 kroner (56,401,000 kroner to Germany, 199,922,000 kroner to Great Britain). The principal articles of export to England are butter and live animals. The value of the butter export increased from £767,190 in 1870 to £7,309,831 in 1898. The principal articles of import from England are cotton manufactures, yarn, coal, and iron. The export of horses in 1898 was 15,423 in number; of cattle, 36,066; and of sheep, 2,644. Of food substances the export value was 204,200,000 kroner; of raw materials, 25,400,000 kroner; of articles of personal and household consumption, 6,500,000 kroner; and of seeds, fodder, and fertilizers, 2,400,000 kroner. The revenue for the year ending March 31, 1900, was 72,561,487 kroner; the expenditure, 77,509,052 kroner. The public debt in 1900 was 207,419,912 kroner, of which 138,-512,250 kroner is owed abroad, mostly at 3 per cent. On Jan. 1, 1899, the merchant navy consisted of 3,774 vessels of 394,685 tons, of which 510, of 225,422 tons, were steamers. In 1898 there were 1,568 miles of railway, of which 1,108 miles belonged to the state, and 3,029 miles of Government telegraph lines. The army consisted (1899) of 9,769 regulars (824 officers and 8,945 men) and 51,817 reserves; the navy consists of 10 ironclads, 25 torpedo-boats of various classes, and 5 protected vessels.

Religion and Education.—The established religion is Lutheran, to which 99 per cent. of the population belong, and the king must be a member of the Lutheran Church. Other sects are tolerated. The kingdom has a good system of education, which is generally diffused among the people. All children between the ages of seven and fourteen are compelled to attend school. Education is given gratuitously in the public schools to children whose parents are too poor to pay for it. Of higher schools, Denmark has a good university at Copenhagen, 13 gymnasia, 27 Realschulen, and 5 training colleges for teachers.

Government.—The Government is a hereditary constitutional monarchy. The present constitution is embodied in the charter of June 5, 1849, according to which the executive power belongs to the king, and the legislative power is vested in the king and Diet (*Rigsdag*) jointly. The Rigsdag is composed of two houses, called the Landsthing and the Folkething. The latter, which is the lower house, consists of 102 members, elected by universal suffrage for a term of three years. The Rigsdag must meet every year on the first Monday of October. All money bills must in the first instance be submitted by the Government to the Folkething. Besides its legislative functions the Landsthing has the duty of appointing from its midst the assistant judges of the Rigsret, which forms the tribunal before which parliamentary impeachments are tried.

History.—Denmark is one of the three Scandinavian kingdoms. (See SCANDINAVIA.) On the decline of the Roman empire the Scandinavians, under the name of Northmen or Normans, became a formidable and aggressive race, much addicted to piracy and maritime enterprises. The Danes conquered Normandy in 912, invaded England with success in the ninth century, and completed the conquest of it about 1016, in the reign of Canute or Knud, who was perhaps the most powerful monarch of his time. He reigned over Denmark as well as England, and is said to have introduced Christianity into his dominions. Margaret, Queen of Denmark and Norway, conquered Sweden in 1388, and procured the adoption of the Union of Calmar (1397), by which the three Scandinavian kingdoms were united, and her nephew, Eric, was appointed her heir. At her death (1412) each kingdom chose its separate ruler. In 1448 the Danes elected Christian I., Count of Oldenburg, who was the founder of the royal family that has continued to reign to the present time. The monarchy was elective until 1660, when the clergy and people, impelled by enmity to the nobility, ordained that the power of the king should be hereditary and absolute. As an ally of Napoleon, Denmark was involved in a war against Great Britain and Russia, and suffered great disasters. The British fleet bombarded Copenhagen in Sept., 1807. Denmark was compelled to cede Norway to Sweden in 1814. Christian VIII., by the Open Letter of 1846, declared his intention to extend the law of succession of Denmark proper to the duchies of Schleswig-Holstein, the inhabitants of which are mostly Germans, in order to secure in this way the indivisibility of the Danish monarchy. When Frederic VII. in 1848 ascended the Danish throne a rebellion broke out in Schleswig and Holstein, which was put down in 1850, though it was openly supported by Germany and secretly also by Prussia. In the meanwhile the non-German great powers and Sweden had agreed (June, 1850) to declare the indivisibility of Denmark, and Austria soon after (Aug., 1850) acceded to this declaration. On June 5, 1851, Prince Christian of Glücksburg was designated in the Protocol of Warsaw as heir to the throne, and on May 8, 1852, he was recognized as such by the great powers and Sweden. In 1849 Denmark had obtained an extremely liberal constitution, which secured the most entire civil liberty and universal right of suffrage. This constitution was somewhat modified in 1855, and extended to the duchies, but found no favor with the German population of Holstein, which cared very little for liberty, but was very enthusiastic for its German nationality. In Nov., 1858, the king abolished the joint constitution of the Danish state for Holstein and Lauenburg, and restored absolute monarchy in these countries. By a proclamation of Mar., 1863, a new fundamental law was prepared for Denmark and Schleswig. War with Germany broke out soon afterward, and was terminated by the peace of Vienna (Oct., 1864), and Denmark was compelled to renounce all claim on Schleswig-Holstein. The question as to whether the duchies should be subject to Prussia or whether they should be dependent upon Austria was settled by the war of 1866 in favor of Prussia. See SCHLESWIG-HOLSTEIN. See DENMARK, in the Appendix.

See Allen, *Haandbog i Fædrelandets Histoire* (6th ed. 1863); Dahlmann, *Geschichte von Dänemark* (3 vols., 1840–43). For the language and literature, see DANISH LANGUAGE and DANISH LITERATURE.

Revised by C. K. ADAMS.

Den'ner, BALTHASAR: painter of portraits and genre; b. in Hamburg, Germany, Nov. 15, 1685. He painted with such extreme minuteness that his heads have become synonymous with the most slavish literalism, the pores of the skin, the hairs of the eyebrows, and even the objects reflected in the eyes, being rendered. As curiosities of art his portraits are ranked highly. In spite of this excessive attention to detail of the least importance, Denner showed a great mastery of execution, and his work has not the hardness of the early purists, as it has none of their exaltation. D. in Rostock, Apr. 14, 1747. W. J. S.

Den'newitz: a village of Prussia; province of Brandenburg; 42 miles S. S. W. of Berlin (see map of German Empire, ref. 3–G). Here, on Sept. 6, 1813, an army of 50,000 Prussians, under Bülow, defeated an army of 70,000 French, Saxons, and Poles commanded by Marshal Ney. The French lost about 15,000 killed, wounded, and prisoners.

Dennie, Joseph: author and critic; b. in Boston, Mass., Aug. 10, 1768; graduated at Harvard and studied law, which, however, he did not practice. From 1796 to 1798 he edited *The Farmer's Weekly Museum* at Walpole, N. H. Having removed to Philadelphia in 1799, he founded the *Portfolio*, a literary magazine, which he edited with ability from 1801 till 1812. Among his writings is *The Lay Preacher*. D. in Philadelphia, Pa., Jan. 7, 1812.

Dennis, John: English dramatist and writer of satires and pamphlets; b. in London in 1657. He studied at Cambridge, made the tour of Europe, and after his return was led to devote himself to literature through his acquaintance with Dryden, Wycherly, etc. He had no talent. Nevertheless, his tragedy *Love Asserted* (1704), achieved a success by its anti-French tendency. His temper was quarrelsome, and he provoked the enmity of many persons by his libels. He was lampooned by Swift, and satirized by Pope in the *Dunciad*. D. Jan. 6, 1734.

Dennison: village; Tuscarawas co., O. (for location of county, see map of Ohio, ref. 4–H); situated on railway, 100 miles E. N. E. of Columbus; has railway car-shops and machine-shops. Pop. (1880) 1,518; (1890) 2,925; (1900) 3,763.

Dennison, William: statesman; b. in Cincinnati, O., Nov. 23, 1815; graduated at Miami University in 1835; admitted to the bar in 1840; practiced at Columbus, O., 1840–48; was a member of the Legislature of Ohio 1848–50; president of the Exchange Bank and of the Columbus and Xenia R. R. Co.; delegate to the Pittsburg convention in 1856 which inaugurated the Republican party, and also to the Philadelphia convention; Governor of Ohio 1860–62; Postmaster-General 1864–66. D. in Columbus, June 15, 1882.

Denon, de-nōṅ', Dominique Vivant, Baron: artist and author; b. at Châlons-sur-Saône, France, Jan. 4, 1747. He became *chargé d'affaires* at Naples in 1782 and a member of the Royal Academy in 1787, after which he devoted himself to art, and gained distinction as an art critic. He accompanied Bonaparte to Egypt in 1798, and in 1802 he published an admirably illustrated work entitled *Travels in Upper and Lower Egypt*. D. in Paris, Apr. 27, 1825, leaving an unfinished *History of Art*.

Density [Lat. *den'sitas*, deriv. of *densus*, thick]: in physics, the quantity of matter which a body contains per unit of volume. Density thus defined is called "absolute density." The quantity of matter in any body is called its *mass*, and is measured by the weight of the body, to which it is always proportional. The density of bodies is therefore directly as their mass and inversely as their volume. It is customary to express density in terms of that of some substance selected as a standard. In the case of solids and liquids water at 4° C. is the usual standard. Gases are compared with air or with hydrogen. This is "relative density," a term which is synonymous with specific gravity.

E. L. Nichols.

Density of the Earth: See Earth (*Density*).

Dental Formula: a tabular mode of indicating the kinds and number of teeth possessed by a mammal. The letters *i.*, *c.*, *pm.*, and *m.*, respectively mean *incisor*, *canine*, *premolar*, and *molar*, while figures affixed to these letters denote the number of each kind of tooth. These figures placed above or below a horizontal line indicate that the teeth referred to occur in the upper or lower jaw. The dentition of both sides is often given, but, as the number of teeth on each side is normally the same, it is common to give the formula for one side only. When it is necessary to specify the first, or milk dentition, the letter *d.*, deciduous, or *M.*, milk, is prefixed to the formula. The milk or deciduous molars correspond to the premolars of the adult animal.

The dental formula of an adult man is as follows: $i.\ \frac{2-2}{2-2}$, $c.\ \frac{1-1}{1-1}$, $pm.\ \frac{2-2}{2-2}$, $m.\ \frac{3-3}{3-3}$, or $i.\ \frac{2}{2}$, $c.\ \frac{1}{1}$, $pm.\ \frac{2}{2}$, $m.\ \frac{3}{3}$.

The formula for a child is $M.i.\ \frac{2-2}{2-2}$, $M.c.\ \frac{1-1}{1-1}$, $M.m.\ \frac{2-2}{2-2}$. The terms cutting-teeth and check-teeth are used, especially by English writers, to denote respectively the incisors and canine collectively and the premolars and molars. See also Teeth.

F. A. Lucas.

Denta'lium [Mod. Lat. deriv. of *dens*, tooth, in allusion to the shape of the shell]: a genus of marine *Mollusca* which presents so many points of difference from all other mollusks that it forms a group—class *Scaphopoda*—by itself. The shell, shaped like an elephant's tusk, is open at both ends, and from the larger opening the burrowing foot and the fringe-like gills can be protruded. The body is perfectly bilaterally symmetrical, the nervous system is untwisted, the sexes distinct. With the mouth is connected a lingual ribbon. (See Mollusca.) There is no heart and there are no distinct blood-vessels. The embryos are remarkable for the development of five ciliated rings about the body behind the ring which is characteristic of all mollusean larvæ. About fifty species of *Dentalium* (and the allied genera *Siphono-dentalium*, *Entalium*) are known, all living in the sand in depths of 10 to 100 fathoms in the seas of all parts of the world.

Dentalium elephantinum.

J. S. Kingsley.

Denta'tus, Manius Curius: a Roman plebeian consul noted for his martial exploits, frugality, and integrity; said to have been born with teeth; hence the surname. He defeated the Samnites in 290 B. C., and gained a decisive victory over Pyrrhus near Beneventum in 275. He was consul for the third time in 274, and censor in 272 B. C. During his censorship he constructed an aqueduct which conveyed water from the Anio to Rome. D. in 265 B. C.

Den'tex [New Lat., from Lat. *dentix*, name of a fish, now called in Ital. *dentale*; from Lat. *dens*, *dentis*, tooth]: a genus of marine fishes belonging to the sub-family *Denticinæ* (of which it is the type) and family *Sparidæ*, but resembling perch in shape. They have sealy cheeks, curved canine teeth in each jaw, a single dorsal, and a forked tail. They are found in the Mediterranean and Red Seas, off the coast of South Africa, East Indies, China, and Japan. Some species attain a weight of 30 lb. and are valuable for food.

F. A. L.

Dentifrice [from Lat. *dentifri'cium*, tooth-powder; *dens*, tooth + *frica're*, rub]: a powder or wash of various kinds used for cleaning the teeth. Among the substances employed are charcoal, chalk, common salt, myrrh, catechu, cinchona, phosphate of soda, and cream of tartar.

Den'tils [mod. deriv. of Lat. *dens*, tooth]: in architecture, square blocks or projections in the bed-moldings of the cornices of the Corinthian, Ionic, and composite orders. The term is also applied to ornaments in cornices of rooms which are founded on the same style of decoration.

Dentin, or **Dentine**: See Teeth.

Dentiros'tres [from Lat. *dens*, *dentis*, tooth + *rostrum*, beak]: a term applied by Cuvier to a group of passerine birds whose members have the upper mandible notched on each side near the tip. It included the greater number of insectivorous birds, thrushes, warblers, Old World fly-catchers, shrikes, etc., and was contrasted with Conirostres, Fissirostres, and Tenuirostres (*qq. v.*). The term was used in the same way by G. R. Gray in his *Hand List*, and in a much restricted sense by more recent ornithologists. As groups thus characterized have proved to be more or less unnatural, the use of the word has been practically abandoned.

F. A. Lucas.

Dentistry [deriv. of *dentist*: Fr. *dentiste*: Ital. *dentista*, deriv. of Lat. *dens*, tooth]: that branch of the healing art which has for its province the treatment of diseases and lesions of the human teeth and their replacement by substitution when lost.

While civilized nations consider their teeth most beautiful in their natural form and color, some nations mutilate their teeth by chipping, filing, and altering their form, in some cases also staining them to conform to their peculiar ideas of beauty. Mutilation is practiced by certain wild tribes of Africa, New Guinea, Java, and the Tasmanian coast of Australia, and is prompted by fashion, superstition, or conformity with religious rites. With the Malays filing the teeth is a religious act performed at puberty, while in Indo-China and Japan girls have their teeth stained black at the time of marriage. Filing the front teeth to points is practiced by Abyssinians to increase the savageness of their aspect and terrify their foes.

Early History.—Herodotus, the Greek historian (*Hist.* ii.,

84), tells of the attention given to diseases of the teeth as well as of the eye and ear in Egypt, and Belzoni and other writers claim to have found in Egyptian tombs artificial teeth made from ivory and wood, some of which were mounted upon gold plates. Teeth of mummies at Thebes are said to have been found filled with gold and a white cement, but of this there is no positive evidence. In 1884 Dr. Van Marter, of Florence, discovered in the museum at Corneto, Italy, skulls exhumed from Etruscan tombs in which pure gold wire was wound around natural teeth and the spaces between them where teeth were lacking, in such a way as to indicate plainly that artificial or possibly human teeth had at some time been thus supported in place.

As the Etruscans preceded the Romans in occupying the land now known as Italy, the antiquity of this form of reparative dentistry is well established. As to the extent to which the Greeks or Egyptians practiced dentistry as a specialty before the Christian era, there is no definite information. The only writings of ancient times extant where dentistry is spoken of as an art are those of Galen, who wrote in the second century after Christ. From Galen until Ambrose Paré published his celebrated work on surgery in 1550, but little was added to dental literature. During the sixteenth century probably less than a dozen dissertations on the teeth were published. In the seventeenth century about 50 and in the eighteenth some 150 essays and volumes upon the subject appeared, the result of the labors of such men as Hunter, Jourdain, Lécluze, Blake, etc.

Later History.—During the eighteenth century dentistry became a subject of more critical inquiry and thorough investigation. Men of intelligence and education devoted themselves to it exclusively, and as a result its advancement in both literary and scientific directions during the nineteenth century has been most marked. This is shown by the fact that from 1800 to 1892 there were published in Europe and America some 200 volumes treating exclusively of the care and diseases of the teeth, besides numerous monographs upon the same subject. Among the list of European authors appear the well-known names of Bell, Baume, Delabarre, Laforgue, Fox, Maury, Le Maire, Owen, Nasmyth, Tomes, Wedl, Magitot, and Coles, while in the U. S. the more prominent authors are Gardette, Koecker, Fitch, Spooner, Goddard, Harris, Taft, Richardson, Garretson, Gorgas, Flagg, Litch, Black, and Miller.

Until the latter part of the eighteenth century any advance in dentistry was confined to Europe, but since then its most rapid strides have been taken in the U. S.

Dentistry in the U. S. and Europe.—The first dentist in the U. S. of whom there is any account was one Le Maire, who accompanied the French army which aided the revolutionists of 1775–83. Soon after the arrival of Le Maire an English dentist named Whitlock settled in the U. S. John Greenwood, who began to practice in New York about 1788, is believed to have been the first native dentist. In 1790 and in 1795 he constructed entire dentures for Gen. Washington. These were carved from ivory and retained in the mouth by means of spiral springs. Greenwood was followed by Spence from England, Gardette from France, Hudson from Ireland, and Koecker from London. In 1820 there were about 100 practitioners; in 1892 the number was 18,000. The first dental school in the U. S. was chartered by the legislature of Maryland in 1839, with the title of the Baltimore College of Dental Surgery: the Ohio College of Dental Surgery (at Cincinnati) was chartered and established in 1845; the Pennsylvania College of Dental Surgery (at Philadelphia) was established in 1856, and the Philadelphia Dental College in 1865. In 1892 the number of dental colleges in the U. S. was 38. The number of graduates from the various dental colleges of the U. S. from 1880–92 inclusive was 6,329, while the number of graduates in 1892 alone amounted to 1,483. Among these were many young women. The first diploma granted to a woman was in 1869. The first dental periodical in the U. S. was published at Baltimore in 1839; in 1892 the number of such periodicals was 17. The first dental society in the U. S., the American Society of Dental Surgeons, was organized about 1840; in 1892 there were 130 of different kinds.

In Europe the number of both periodicals and societies is markedly less than in the U. S. To prevent charlatanism, as well as to encourage a high standard of attainment among those seeking to enter upon dental practice, most countries have enacted dental laws, which require in general that the candidate for practice shall be a graduate of a reputable dental school or pass a satisfactory examination before a legally constituted board. Some countries and certain of the United States require both a diploma and an examination before permission to practice is granted.

Professional Advancement.—In former times a dentist performed all dental operations and manipulations. Many of these are now relegated to specialists; for instance, cases of disease of the soft or bony tissues of the mouth, extraction of teeth under the influence of an anæsthetic, and correction of irregularity of position of the teeth are usually referred to specialists in these departments. The making of sets of artificial teeth, as well as what is denominated crown and bridge work, is attended to by practitioners who limit themselves to one or the other of those branches. The carving and baking of porcelain teeth, which was once done by the general practitioner, was more than fifty years ago turned over to manufacturers.

Operative Dentistry.—The operation requiring the least skill is that of scaling or cleansing the teeth. This consists in the mechanical removal of salivary calculus or tartar, which in nearly all mouths accumulates about the teeth near the gum margin. It is almost entirely composed of mineral ingredients, phosphate and carbonate of lime being the chief, and unless removed in time is apt eventually to cause the teeth to become loose and fall out. Its rapid accumulation, even in the mouths of the young, is one reason why it is well to have the teeth examined at least once a year. The use of a brush of medium hardness and tooth-powder of very fine grit will do much to check the accumulation of the accretion. The dentist removes tartar with instruments called scalers, and then completes the process of cleansing with wooden points charged with fine powder. Whatever the condition of the teeth may be, they should be brushed at least twice daily, and a quill toothpick or floss silk should be used after each meal, for decomposing articles of food generate an acid which directly attacks and dissolves the tooth substance.

Filling.—When teeth have once become affected by decay, it is necessary to check its inroads and repair the injury done. This is accomplished by the operation known as filling. The first step after gaining proper access to the cavity is to remove all the decayed matter, shape the cavity so that it will mechanically retain the filling, and dress the margins to the line of strength. After this the cavity is usually swathed with some medicament having antiseptic and germicidal properties, such as carbolic acid or one of the essential oils. After careful drying the cavity is ready for a filling. The number of materials for filling is very great, none of them possessing all of the best qualities. Of the metals, gold is preferred, because of its purity, adaptability, and resistance to both the force of mastication and the action of the fluids of the mouth. Tin foil probably comes next to gold, is worked in a similar manner, requires somewhat less time for its introduction, is almost as durable, and is much less expensive.

Amalgam, which consists of an alloy of two or more metals (principally silver and tin) mixed into a pasty mass by the aid of mercury, is very largely used for the filling of teeth. It is easily prepared and quickly introduced, but the molecular changes occurring in the mass during solidification make it a less perfect stopping than any of the previously named metals, while its discoloration causes it to become quite unsightly. Nevertheless its durability is often remarkable.

Gutta-percha is the only vegetable product in use for filling teeth, and to add to its resisting power it is mixed (after being refined and bleached) with a small proportion of inorganic matter, usually pulverized feldspar or oxide of zinc. It is introduced with heated instruments, and possesses reasonable durability. Its inertness, non-conductivity, and color especially recommend it in certain cases.

There are only two combinations of metallic oxides in common use: *oxychloride of zinc* and *oxyphosphate of zinc*. The former consists of zinc oxide combined with dilute zinc chloride; the latter of zinc oxide with deliquesced phosphoric acid.

The combination in each case is made just before introduction, for the "setting," especially in the case of the phosphate, is very rapid.

The color of these fillings is harmonious with that of the tooth, but each is irritating to the vascular tissue of the tooth, and their durability is so slight that they can be regarded only as temporary fillings.

In the introduction of any of the filling materials mentioned, except gold and tin, the cavity can usually be pro-

tected from the fluids of the mouth and kept dry sufficiently long for the introduction of the filling by the aid of small mouth-napkins, but when either of the two first-named metals is employed a longer time is required for insertion, and a coffer-dam of rubber is used. This is simply a piece of sheet-rubber with a small hole punched through it, which, when stretched and slipped over the tooth, grips it with such tenacity that all moisture is excluded. It was invented by Dr. S. C. Barnum, of New York, in 1864, and is probably the most useful dental appurtenance ever devised.

Gold as prepared for dental use is primarily either in the form of foil or of a loose crystalline mass thrown down from a solution. Foil in being further prepared for use is folded into wide or narrow ribbons, twisted into ropes, or rolled into cylinders of various sizes and density. In whatever form it may be employed, it is always introduced in small portions at a time, and thoroughly condensed, so that the filling when completed shall be as dense and homogeneous as possible in order to exclude all moisture and extraneous matter, and withstand the force of mastication. When introduced, it is most important that the external surface be dressed to conform to the original outline of the tooth and be made absolutely smooth.

The instruments employed in removing the decay and preparing the cavity are usually steel hand instruments of various forms, and technically known as chisels and excavators. Since about 1870, however, hand instruments for these operations have been largely superseded by burs and drills, which, being operated through the medium of a dental engine, do their work more satisfactorily and rapidly than formerly. The engine in its simplest form is a miniature lathe-head connected with a movable or flexible shaft terminating in a mandrel which carries the various burs. The lathe-head is mounted upon a delicate but rigid upright standard with base, the power being communicated to it by means of a cord or belt connected with the driving-wheel, which in turn may be operated by the foot, a water-motor, or an electric-motor. In some cases the head and shaft are mounted upon a swinging bracket, thus doing away with the standard and base.

The condensation of the gold during introduction, which was at one time done entirely by hand-pressure, is now accomplished by the impacting power of a mallet in some form. The hand mallet, made of wood or metal; the automatic mallet, operated by a spiral spring alternately compressed and released: the mechanical mallet, operated by the engine; or the electric mallet, operated by the electric current—all are in use.

The operation of preparing the cavity has been measurably relieved of its most objectionable features by the present methods of desiccating the cavity with warm air, the use of medical pain-obtundents, and the employment of rapidly revolving and keen-edged burs.

Another method of filling is known as porcelain filling, and possesses some advantages over the older methods. It consists in shaping a piece of porcelain to the form of the prepared cavity, and cementing it into place with thinly mixed phosphate of zinc. There are three ways of preparing and shaping the porcelain stopper: 1, by grinding a section from a porcelain tooth of proper shade; 2, by burnishing into the prepared cavity a piece of platinum foil, removing it, and filling the mold thus formed with pulverized silex or "tooth-body," and baking it in a muffle-furnace; 3, by burnishing pure gold or gold and platinum foil into the cavity, as in the previous case, filling the mold with pulverized glass of suitable color, and fusing it in the flame of an alcohol lamp. In both of these latter methods the gold or platinum foil is stripped from the mass before it is cemented into place. The third method produces a filling which is simply fused glass, but for convenience is included under the head of porcelain filling. Fillings of this character have the advantage of being formed out of the mouth, and are highly esteemed because by the judicious admixture of earthy coloring-matter they can be made to approximate the color of the natural tooth more closely than any other; but as the cement which retains them in place is so readily acted upon and dissolved by the fluids of the mouth, their durability is not as great as might be desired.

Probably the most common complication met with in connection with the preparation of cavities is the exposure of that delicate and highly vascular organ of sensation and nutrition, occupying the central portion of the tooth, known as the dental pulp. In the earlier days of dentistry such exposure was deemed sufficient cause for the extraction of the tooth, but later it was found that it might be devitalized by the application of certain medicaments (usually arsenious acid), removed, and its place filled with some inert and insoluble substance, thereby greatly prolonging the usefulness of the tooth. Such continues to be considered good practice, but an advance has been made in that simple exposure of the pulp does not necessarily call for its devitalization. The more conservative method now prevails of capping or covering the exposed portion with some non-irritant substance, and filling over this in the usual way.

When, as a result of long continued decay or other cause, the pulp loses its vitality and is not removed, putrefaction sets in, and an abscess at the end of the root is the result. Relief is usually gained by perforation to allow the gases resulting from putrefaction to escape, after which it is necessary to remove the dead pulp tissue, and inject into the canal formerly occupied by it such medicaments as will sterilize and destroy the microbic agents that were active in the production of the abscess. For this purpose various drugs are employed, such as creosote, carbolic acid, iodoform, eugenol, oil of cassia, etc. Before introducing any of these agents it is necessary to rid the abscess sac of its purulent contents. After each treatment some of the medicament used is allowed to remain in the canal which is hermetically sealed at its outer opening. When a cure has been effected, the entire canal is permanently filled, as in the case when removal of the pulp followed immediately upon its devitalization.

Anæsthetics.—It is said that at least one-third of the teeth extracted in civilized countries are removed under the influence of anæsthetics. Ether and chloroform, alone or combined, were in common use at one time for the purpose, but nitrous oxide has largely supplanted them, its use being comparatively free from danger, and its effects evanescent. In cases where it is desirable slightly to prolong the anæsthetic effect, combinations of the vapor of ether with gas are often used, and with satisfactory results. The reluctance felt by many persons to being placed in an unconscious condition gave rise to the employment of agents that would exercise a benumbing effect only upon the parts to be operated upon. Among these were the galvanic current and the spray of such volatile liquids as sulphuric ether and rhigolene, but all have been superseded by muriate of cocaine. This is employed in the form of a 4-to-10-per-cent. aqueous solution, and is hypodermically injected into the soft tissues surrounding the tooth. In some cases other drugs, such as carbolic acid, chloral hydrate, menthol, etc., are introduced into the solution, but probably the cocaine is alone responsible for the effect produced.

Oral Surgery.—The treatment of all lesions, diseases, and abnormal growths occurring in the soft and hard tissues of the mouth, aside from the teeth themselves, as well as all surgical operations called for in the same region, fall within the province of oral surgery. One novel operation in this department was advocated and performed by Dr. Younger, of San Francisco, in 1881. It is the implantation of a human tooth in an artificially formed socket of the jaw. The operation may be briefly described as follows: A tooth that has been extracted (no matter how long before) is prepared by thoroughly reaming out the contents of the root canal from the root end, and filling it with softened gutta-percha, capped with a minute plug of gold foil. The tooth thus prepared is placed for a time in a sterilizing solution of mercuric bichloride, kept at a temperature of about 110° F. The cavity into which this tooth is to be implanted is formed by making an incision in the soft tissues overlying the jaw-bone at the point desired, drilling into the bony tissue beneath with a spear-shaped drill to a depth corresponding to the length of the root of the tooth to be implanted, reaming this to a proper size, and then, after irrigating the cavity with a sterilizing liquid, placing the tooth in position and ligating it to any adjoining teeth. After the lapse of a week or ten days the ligatures are removed, and the tooth is found to have become firmly fixed in its socket. The tooth must be sound, must have upon the surface of its root a covering of healthy peri-cemental membrane such as existed there at the time of its extraction, and must correspond in size and color with the adjoining teeth. A new bony material forms in the socket surrounding the tooth, holding it firmly in position for a number of years. The percentage of operations of this character that have been successful is large.

Regulating the Teeth.—The teeth of the second or permanent set are liable to be misplaced either during eruption

or afterward, often crowding or overlapping each other. The time at which correction can be most readily and perfectly accomplished is between the twelfth and twentieth years, while the bony process which holds them in position is still pliable. The appliances used in the operation are almost innumerable, and are constructed from a variety of materials varying from a delicate silk ligature to the stiffest gold or steel spring.

After the teeth have been brought into proper position it is necessary to retain them firmly by artificial means until new bony material has been formed about their roots. This requires six months or longer. If released earlier than this they will most likely return to their former positions.

Mechanical Dentistry.—Sets of artificial teeth, or dentures, as they are technically called, consist of porcelain teeth mounted upon and attached to a base-plate covering the whole or a portion of the arch and roof of the mouth. The teeth are called porcelain because they are composed of the same minerals (silex, feldspar, and kaolin) and are baked or burned in the same manner as porcelain ware in general. The making of them is a large industry in itself, there being at least fifty manufactories in the U. S., and probably half as many more in other countries, principally in Great Britain, France, and Germany.

In the making of the teeth the finely pulverized mineral ingredients, in proper proportion, are mixed with water into a putty-like mass, which is then placed in carved molds and subjected to great pressure to consolidate it. After this the molded teeth are removed, thoroughly dried, placed on fire-clay slabs, and vitrified in a large furnace. The platinum pins which are found in teeth, and furnish the means by which they are attached to the tooth-plate, are introduced in the process of molding. The enamel or flux which gives to the tooth its polished appearance and the coloring-matter of the gum portion are also laid on in the mold before the mass of "body" is introduced. The various colors or shades in different teeth are produced by incorporating with the body certain metals or their oxides.

Metal Plates.—Gold is the principal metal now used as a basis for artificial teeth, silver having fallen into disfavor. An impression of the form of the jaw and palate is taken, usually with plaster-of-Paris mixed with water. From the impression a plaster model is made, and from the plaster model, by the process of molding in sand, a duplicate in zinc is produced, from which in turn a reverse or counter-die of lead is made. Between these two a properly shaped piece of gold plate is laid, and by repeated swaging is made to assume the shape of the zinc die. This constitutes the plate proper, and to it the teeth, after being arranged and ground to fit, are attached by means of pieces of heavier gold-plate, which are at the same time soldered to the pins in the teeth and to the plate. During the soldering the teeth and plate are immersed in a mixture of sand or asbestos and plaster, to guard against the breaking of the teeth by sudden change of temperature or the warping of the plate. When cool the piece is carefully smoothed and polished.

Vulcanite plates have vulcanized rubber instead of metal for the base. For their construction the impression and model are made the same as for metal-work, but no swaging or soldering is required. Upon the plaster model a temporary base-plate of wax is formed, having a raised ridge of wax to represent the length and outline of the teeth, and upon this, after being mounted upon an articulator, the teeth are arranged or "set up" as intended, and the whole made smooth and shapely by the addition of melted wax until the exact form of the finished plate is obtained. The whole is then incased in plaster in a parting-flask, and after the plaster has become hard the flask is opened, the wax removed, and its place supplied with pieces of warm vulcanizable rubber. The flask is then again closed and pressure applied to force out the excess of rubber, after which it is placed in the steam vulcanizer and the mass indurated by subjecting it to a high heat for a given time. The completed piece is then trimmed and polished by means of files, scrapers, and graded polishing powders.

Celluloid Plates.—In making plates of this material, which lacks durability, the process is very similar to the one just described. The difference consists principally in the method of molding the plate, for while rubber is packed into the flask in small pieces and in a soft state, the celluloid is introduced in the form of a hard "blank," and after being softened by heat is pressed into form. After being "formed" it is allowed to cool, when it resumes its former hardness. It is then finished in the same manner as a rubber plate. The teeth used for both rubber and celluloid work are usually arranged in blocks of "twos" and "threes," and have the pins headed on the outside to enable them to be retained in place in the material of the plate.

Continuous-gum Plates.—In 1848 Dr. John Allen, of New York, invented an improved method of making a plate of porcelain with a platinum base. The platinum was swaged to the form of the mouth and the teeth soldered to it, very much as in the construction of other metal plates. After this the entire lingual surface of the plate was covered with a thin layer of porcelain *body* and fired in a furnace. A second coating was then put on and fired, after which the final layer of pink gum enamel was applied, and the piece passed through the fire for the third time. It came out of the fire finished and smooth. This style of work found much favor with the profession on account of its cleanliness and great beauty, for, being made of porcelain tinted to the exact shade of the natural gum, its artificiality could scarcely be detected. It is still considered the most artistic work in mechanical dentistry, and the only drawbacks to its more general use are its brittleness, difficulty of repair, and expensiveness.

Crown and Bridge Work.—This is a method of supplying artificial crowns or teeth without the employment of a plate. The attaching of an artificial crown to a natural root which has through accident or decay been deprived of its own crown was practiced in a rude way at least as early as the beginning of the nineteenth century, and as the method was scientific and the results artistic it has been continued to the present time. Originally the crown of an extracted tooth was used for mounting upon the natural root, but as it proved disappointing in durability it was soon superseded by one of porcelain. The porcelain crowns were first made with a round hole in the base into which was fitted a pivot or dowel of tough hickory-wood. The natural hole (or canal) extending through the root, after being closed at its upper end, was reamed out to the size of the wooden dowel and the porcelain crown with its dowel forced into position. Many crowns thus mounted have been worn with satisfaction for many years. Improvements have from time to time been made in the method, such as the employment of a platinum dowel fused into the crown at the time of its construction, placing a gold or platinum ferrule around the exposed edge of the root to guard against splitting, and the making of crowns partly of gold and partly of porcelain, so as to combine the strength of the metal with the beauty of the porcelain. All crowns with metal dowels are cemented into the root either by means of warm gutta-percha or zinc phosphate, which serve the triple purpose of greater security, prevention of decay, and more perfect cleanliness. Single crowns, proving so useful, naturally led to experiment in the way of uniting several crowns together to bridge a space created by the entire loss of some teeth. The results have been so satisfactory that the method has come to be recognized as one of the most useful and artistic in the whole range of dental substitution. In bridge-work it is usually necessary to have two teeth or roots, one at either end of the space, to act as piers or abutments. These terminal teeth or roots have dowel crowns or metal caps made for them, and in the intervening space are arranged a suitable number of gold and porcelain crowns (called "dummies"), after which all are united together with gold solder and properly smoothed and polished. When completed, the dowel crowns or caps are lined on their lower portions with zinc phosphate and the entire piece, or *bridge*, quickly forced into position. If thus properly mounted it becomes a permanent part of the dental masticating apparatus, and answers all required purposes.

A modification of this method consists in having the dummies alone united together and arranged so that they can be fastened to the pier crowns or caps after the latter have been placed in position. This is known as a *removable* bridge, because it can at any time be readily removed for cleansing or repair. A *permanent* bridge is sometimes constructed of porcelain and platinum in one piece, and by some practitioners is thought to possess advantages over the one previously described. In its construction a bar of platinum is made to bridge the space, and is fitted at either end into cavities prepared for it in the pier-teeth. Upon this bar porcelain teeth are arranged and attached by adding porcelain "body" and fusing in a furnace. The piece when completed is placed in position, and secured by plugging the ends of the bar into the prepared cavities in the natural teeth. See TEETH.

S. H. GUILFORD.

Dentition: See TEETH.

Denton: city and railway junction; capital of Denton co., Tex. (for location of county, see map of Texas, ref. 2–H); has numerous churches, a public school, normal college, flouring-mills, two nurseries, cotton and oil mills, water-works, electric lights, and several flowing artesian wells. Pop. (1880) 1,194; (1890) 2,558; (1900) 4,187. ted, 3,500.

EDITOR OF "CHRONICLE."

D'Entrecasteaux, dăn'tr'kăs'tō', **Archipelago**: a part of the British colony of New Guinea; lying N. of the south-eastern extremity of New Guinea and N. W. of the Louisiade islands. The largest island is Fergusson, the next Normanby and Goodenough islands. Area, 1,214 sq. miles. Pop. estimated at 12,400.

Denudation [from Lat. *denuda're*, lay bare, deriv. of *nu'dus*, bare, naked]: in geology, as defined by Lyell, "the removal of solid matter by water in motion, whether of rivers or of the waves and currents of the sea, and the consequent laying bare of some inferior rock. This operation has exerted an influence on the structure of the earth's crust as universal and important as sedimentary deposition itself: for denudation is the necessary antecedent of the production of all new strata of mechanical origin. The formation of every new deposit by the transport of sediment and pebbles necessarily implies that there has been somewhere else a grinding down of rock into rounded fragments, sand, or mud equal in quantity to the new strata." Denudation may be divided into *subaërial*, which is effected by the action of wind, rain, and rivers, and *submarine*, which is caused by tides and currents of the sea. In many instances deep and wide channels or valleys have been excavated in rocky strata by the long-continued action of rivers; and these are called *valleys of denudation*. As the strata exposed on the sides of these valleys correspond to each other, both in composition and order of position, it is evident that they were originally continuous. "The larger part of the valleys of the world," says Dana, "are formed entirely by running water."

Denver: city and important railway center; capital of Colorado and of Arapahoe County (for location of county, see map of Colorado, ref. 2–F): beautifully situated on South Platte river, 15 miles E. of the base of the Rocky Mountains; 5,200 feet above the level of the sea; in lat. 39° 45′ 21·68″ N., lon. 104° 59′ 35·05″ W. It commands a magnificent view of mountain-scenery, including Pike's, Long's, and other noted peaks perpetually covered with snow. The streets are wide and shady, and the residences and public buildings, built largely of brick and yellow stone, are stately, handsome, and attractive. Denver is appropriately called "The Queen City of the Plains."

Public Institutions, etc.—The city has 142 churches, among them St. John's Cathedral (Protestant Episcopal), noted for its stained glass window representing the Crucifixion. The public-school system is excellent. There were in 1900 75 buildings and 700 teachers. There are ten public and private libraries. The city is also the seat of Denver University, Wolfe Hall (a ladies' seminary), three medical colleges, and several private schools. The State capitol is 383 feet long and 313 feet wide. It stands on Capitol Hill, where is obtained the best view of the city. Other prominent buildings are the city-hall, the county court-house, and especially the U. S. court-house and post-office. Denver has 143 miles of electric street railways, and is lighted by gas and electricity. It has an excellent system of water-works; water is brought from the mountains. Seven railways center here, and there is a large and commodious Union depot. All the Eastern trunk lines maintain offices here. Denver has eleven parks, the largest, City Park, containing 340 acres.

State capitol, Denver, Col.

Manufactures and Commerce.—Denver is an important center for mining, agriculture, and stock-raising, the leading industries of the State. It has a branch U. S. mint and many important manufactories. Three smelting-works in 1900 produced gold, silver, lead, and copper bullion to the value of $19,068,777. Semi-official statistics for the year 1901 showed 600 manufacturing establishments: capital about $7,500,000; average number of persons employed, 15,211; wages paid (round numbers), $9,500,000: value of products, about $40,000,000.

There are four national banks, with a capital of $1,250,000.

Population.—Denver was settled as a mining-camp in 1858–59. Its growth has been rapid and steady. Pop. (1870) 4,759; (1880) 35,629; (1890) 106,713; (1900) 133,589.

Denver, Gen. JAMES W.: soldier and frontiersman; b. in Winchester, Va., 1817; moved to Ohio with his father in 1830; studied law; moved to Missouri; raised a company and served in the Mexican war; went to California in 1850, where he became prominent in politics and was elected Secretary of State, and afterward elected to the Thirty-fourth Congress as a Democrat. Before the end of his congressional term he was appointed commissioner of Indian affairs, but left the office to accept the office of Governor of Kansas. He returned to Washington after twelve months of service, leaving the Territory well organized and law-abiding. He returned to California in 1859, but soon after removed to Wilmington, O.; served in the Union army during the civil war until 1863. Gen. Denver suggested the name *Colorado* for the Territory formed out of Kansas, and the city of Denver was named in his honor. D. Aug. 9, 1892.

Denver, University of: See the Appendix.

De'odand [from Lat. *Deo dandus*, to be given to God; *deo*, dative of *deus*, God + *dandus*, fut. pass. ptc. of *dare*, give]: in English law, any personal chattel, animal, or thing which had caused the death of a human being, and for that reason was applied to pious uses, or, as the term implies, given to God. It was, in fact, forfeited to the king, and distributed in alms by his high almoner. The origin of this singular law is very obscure, and the juridical development which in course of time it underwent affords no light. A distinction was made between an animal or a thing in motion and one at rest. If a sailor fell overboard and was drowned while the vessel was in motion, both the hull and the cargo were forfeited; if the vessel was at anchor, only the hull, not the cargo, was deodand. If a man was thrown from a cart and killed while the cart was in motion, the cart and the load were forfeited: if he fell while climbing the wheel, only the wheel, and not the cart, was deodand. But these and other distinctions of similar description seem to be wholly arbitrary. Two hypotheses have been proffered. The Mosaic law demands that "if an ox gore a man that he die, the ox shall be stoned and his flesh shall not be eaten"; and the Athenian law demanded that "whatever was the cause of a man's death by falling upon him should be exterminated or cast out of the dominions of the republic," thereby ascribing a moral effect on the animal or thing to the fact of its having caused the death of a human being. The law was abolished by statute 9 and 10 Victoria, c. 62.

Deodar: See CEDAR.

Deo'datus, or **Deus'dedit**, SAINT: pope; succeeded Boniface IV. in 615; died Nov. 9, 618, and was succeeded by Boniface V. He is regarded as a worker of miracles. His day is Nov. 8.

Deodorizers: See DISINFECTION.

Deoxidation [deriv. of *deoxidate*: *de-*, privative + *oxidate*, a deriv. of *oxygen*]: the chemical process by which oxygen is abstracted from a compound. This term when applied to metals is synonymous with *reduction*. A compound of a metal with oxygen may in many cases be reduced or deoxidized by heating it with carbon or in a stream of hydrogen gas.

Department [Fr. *département*, deriv. of *départir* : Ital. *dispartire* < Lat. *dis-*, apart + *parti're*, divide (*disperti're*)]: literally, a division; a portion: a distinct province; a territorial division; a principal division of executive government. In the U. S. each of the members of the cabinet is the head of a department. These are called the Departments of Agriculture, Interior, Justice, Navy, Post-office, State, Treasury, and War. A department is not defined by the Constitution, but is recognized and mentioned several times in that instrument. It is a division of government business over which the head, by law, exercises exclusive control, subject only to the supervision and direction of the President. The Attorney-General is the head of the Department of Justice, established in 1870. Portions of the duties of several departments are allotted to bureaus, but there are no separate bureaus in the Department of State or that of the Post-office. The term department is also applied to the three principal branches or co-ordinate powers of the republic. "Under the Federal Constitution," says Gillet, "the national Government is composed of three distinct and independent departments—the *legislative*, the *judicial*, and the *executive*." The whole territory of the U. S. is divided into military departments, each under a general officer.

Department, in geography, a primary division of France. In 1790 the old divisions called provinces were abolished, and the country was divided into eighty-three departments, most of which were designated by the names of French rivers or mountains. The old boundary-lines between the provinces, with their toll-gates, custom-houses, military posts, etc., were effaced, and very often districts from two or three different provinces were united to form one department; the object was centralization. During the first empire the number increased to 130, including Belgium, portions of Italy, etc. At the beginning of the German war in 1870 the number of departments was eighty-nine. In 1871 France ceded to the German empire the whole of Bas-Rhin, a large part of Haut-Rhin, nearly all of Moselle, a small part of the department of Vosges, and a part of Meurthe. Each department is divided into arrondissements, and is governed by a prefect. The principal divisions of Bolivia, Peru, and some other South American republics are also called departments.

Departure, in navigation: See Navigation.

De Pauw University: an institution of learning situated in Greencastle, Putnam co., Ind. It was founded by the Indiana Conference of the Methodist Episcopal Church and chartered in 1837. The first class graduated in 1840. The campuses of the university comprise 150 acres. There are eight buildings used for educational purposes. Until 1884 the institution consisted of a college and a preparatory school, and was called the Indiana Asbury University. Hon. W. C. De Pauw, of New Albany, provided by his will for an endowment of about $1,000,000, besides giving during his lifetime large sums for the better equipment of the university. In recognition of these munificent gifts the corporation in 1884 changed the name of the institution to De Pauw University. At the time of this change the institution became a university in fact. Professional schools of theology and law and special schools of music, art, and pedagogics were established, and graduate courses were added in the college of liberal arts. In 1890 the school of pedagogics was discontinued, and at the same time the university adopted new courses of study in harmony with the best tendencies of the age. A very liberal range of electives is permitted. All candidates for an academic degree must pursue a major equal to one-fourth of their entire course, and a minor equal to one-eighth of the same. The major and the minor must be in unlike subjects. A limited number of courses is required in mathematics, history, English, a foreign language, and a laboratory science. The remainder of the course is made up of free electives. The ordinary class distinctions do not exist. Modern methods of instruction are employed throughout all the departments. As the student advances in his course the individual rather than the distinctively class method is approximated. The libraries and laboratories are conducted according to the best modern plans, and seminaria are established in many of the departments. The various post-graduate degrees require examination on work done in residence. The total number of graduates exceeds 2,000. The present faculty numbers 28 professors and instructors, and the number of students in 1900 was 635. The president is Hillary Asbury Gobin, D. D., elected in 1896.

De Pere, de-peer': city, on railway; Brown co., Wis. (for location of county, see map of Wisconsin, ref. 5-F); situated on the right bank of Fox river, and connected with West De Pere, on the opposite bank, by a bridge 1,500 feet in length. It is supplied with water-power, and has smelting-furnaces, iron-works, and manufactories of agricultural implements, paper, tile, bricks, and woodenware, etc. A line of steamers makes regular trips to Chicago, and the Buffalo line takes freight to Buffalo and intermediate ports. Pop. (1880) 3,824; (1890) 3,625; (1900) 4,038.

Depew, Chauncey Mitchell, LL. D.: lawyer; b. at Peekskill, N. Y., Apr. 28, 1834; graduated at Yale College 1856; studied law; member of the New York Assembly 1861–62; Secretary of State of New York 1863–65; minister to Japan for a short period; candidate of the Liberal Republican party for Lieutenant-Governor for New York 1872, but not elected; chosen regent of the State University 1874; appointed capital commissioner 1871; received the degree of LL. D. from Yale 1887; made the speech nominating President Harrison in the Republican national convention in Minneapolis in June, 1892; delivered the oration at the dedicatory exercises of the World's Columbian Exposition at Chicago Oct. 21, 1892. In 1866 he became attorney for the New York and Harlem Railroad Company, and on its consolidation with the New York Central, counsel for the united companies 1869; second vice-president of the New York Central Railroad Company, 1882; president, 1885; also president of the West Shore R. R. He has won distinction as a railway manager and as a political leader, and is one of the most popular orators and after-dinner speakers in the U. S. He was elected U. S. Senator for New York in Jan., 1899.

De Peyster, Abraham: chief justice; b. in New York, July 8, 1658; eldest son of Johannes De Peyster; deputy mayor of New York in 1677; was acting Governor and president of the council in 1700; chief justice 1700–01; colonel commanding the militia of the city and county of New York, and treasurer for many years of the colonies of New York and New Jersey. D. Aug. 10, 1728.

De Peyster, Johannes: merchant; b. in Haarlem, Holland, about 1600; was of French Huguenot extraction; emigrated to New Amsterdam (New York); was schepen in 1656, etc., alderman in 1666, etc., burgomaster in 1673, and then deputy mayor in 1677, refusing the mayoralty because he could not speak English. He displayed his patriotism and firmness in one of the most trying crises of the Dutch colony (1673). D. in New York about 1685.

De Peyster, John Watts: author; b. in New York city, Mar. 9, 1821; a descendant of Johannes De Peyster, deputy mayor of New York in 1677; educated at Columbia College; joined the State militia, and on the military reorganization of the State was assigned to the command of the twenty-second district; in 1855 became adjutant-general; in 1866 breveted major-general; assisted in organizing the present police force of New York. He has published many military and historical works, including *Life of Field-Marshal Torstenson* (1855); *The Dutch at the North Pole* (1857); and *Personal and Military History of General Philip Kearny* (1869).

Depil'atory [from Lat. *depila're*, deprive of hair; *de*, off + *pilus*, hair]: a name given to applications used to remove hair from any part of the body. A thin paste of powdered quicklime and water applied to any part until a burning sensation is produced, and then wiped off with a wet sponge, will generally remove hair.

Deposit: that which is deposited or placed in trust with another, as earnest money paid by the buyer of goods to make the contract of sale binding, or as title-deeds given as security for debt (a practice once common in Great Britain). Specifically: (*a*) In the law of bailments, the placing of personal property in the hands of another to be kept by him gratuitously and returned upon demand. Various classes of deposits were set up by the civilians according to the circumstances under which the deposit was made or the purpose had in view; thus *necessary deposits* are those made upon some sudden emergency; *voluntary deposits* are such as are made by the consent or agreement of the parties. Where a deposit is made by two or more persons having adverse interests in controversy with respect to it it is called a *sequestration*, and is either judicial or voluntary according as to whether it is made with or without an order of court in the course of a judicial proceeding. (*b*) In banking law, the lodging of money, bills, etc., in a bank so that the rela-

tion of debtor and creditor is thereby established between the depositor and the bank. When the identical articles, whether money, plate, jewelry, or the like, is to be returned in specie it is called a *special deposit*, and the bank is a bailee for hire. F. STURGES ALLEN.

Deposit: village; Broome and Delaware cos., N. Y. (for location of counties, see map of New York, ref. 6–G); situated on the Erie R. R. where it crosses the Delaware river; 177 miles N. W. of New York. It has an academy, union free schools, stock-yards, a planing-mill, a flouring-mill, pearl-button factory, hand-sled factory, and iron-foundry. Pop. (1880) 1,419; (1890) 1,530; (1900) 2,051.
EDITOR OF "COURIER."

Deposition [from Lat. *deposi'tio*, deriv. of *depo'nere*, *depo'situs*, lay down, lay off; *de*, off + *po'nere*, place]: in law, a written statement under oath; specifically and usually the testimony of a witness set down in writing in answer to interrogatories legally exhibited. Depositions are taken either by a judge, a commissioner, or other official authorized by law. The questions to which the depositions are answers are usually put by the parties to the suit or their legal representatives, and an opportunity for cross-examination must be given as in any taking of testimony. It is a rule in the law of evidence that a deposition can not be read where the witness himself might be produced, because his oral testimony is the most satisfactory medium of proof. Depositions are frequently taken to perpetuate testimony likely to be material in the future, but otherwise liable to be then unavailable. Revised by F. STURGES ALLEN.

Dep'ping, GEORG BERNARD: historian; b. at Münster, Prussia, May 11, 1784, but removed in early life to Paris. In 1817 he published in Leipzig a *Sammlung der besten alten spanischen histor. Ritter- u. maurischen Romanzen*. In 1826 he published in French *L'Histoire des expéditions maritimes des Normands et de leur établissement en France au X. Siècle*: in 1834, in German, *Die Juden im Mittelalter*; in 1835 *Histoire de Normandie* (a continuation of the work of Licquet). He began a general history of Spain, but was obliged to give it up for political reasons. Other works by him have less repute, though many of them are valuable. D. Sept. 5, 1853. Revised by A. R. MARSH.

Depres, or **Desprès**, JOSQUIN: musical composer; b. at Vermand, in French Flanders, about 1440. He was a pupil of Ockeghem, or Ockenheim, a noted Flemish musician; at the age of twenty-five went to Rome, on invitation of Pope Sixtus IV., to instruct the musicians of Italy, and remained there until the death of his benefactor (1484), when he repaired to the court of Hercules I., Duke of Este. After a time he became chief singer of the royal chapel of Louis XII. of France, but the closing years of his life were spent at Condé, in French Flanders, in the capacity of a canon of the cathedral. He was a prolific writer of sacred music, and was justly considered by his contemporaries to be the greatest composer of his time. D. at Condé, Aug. 27, 1521.

Deprez, dā-prā', MARCEL: French engineer, electrician; b. at Aillant-sur-Milleron, Loiret, Dec. 27, 1843; studied at the Lycée St.-Louis; failed in his examinations at the Polytechnic School, and was not admitted to the School of Mines. His mechanical and electrical inventions rendered him conspicuous, many of them being of great value, and those made for the Bureau of Naval Ordnance of France caused him to be twice nominated as a chevalier of the Legion of Honor. In the Academy of Sciences on Oct. 2, 1882, a dispatch was read from the committee on electricity of the Exposition of Munich announcing the complete success of the attempt of Marcel Deprez to transmit power by means of an ordinary telegraph wire from Munich to Miesbach, a distance of 35 miles. This was the first practical example of the electrical transmission of power to a distance, an application as now perfected of the utmost value to the industrial world. In 1883, a syndicate, headed by M. Rothschild and the great engineering-shops of Creusot and Fives-Lilles, furnished the money for much more extensive experiments, which were made on the line of the Northern Railway of France, the results of which were reported in 1885 to the Academy as a large advance upon previous experiments. The theory and person of Deprez have been the object of bitter criticism as well as of the highest praise. In 1881 he was made chevalier of the Legion of Honor, in 1883 officer of the same, and in 1886 he was elected member of the Academy in the place of Tresca. Since 1890 he has been Professor of Electricity at the Conservatoire des Arts et Métiers, and of Physics at the College of France. W. R. HUTTON.

Deprez Signal: See RECORDING APPARATUS, PSYCHOLOGICAL, in the Appendix.

Deptford: town of England; on the Thames; 4 miles below London bridge, and separated from Greenwich by the Ravensbourne, which here enters the Thames (see map of England, ref. 12–J). It is partly in Kent and partly in Surrey. The famous dockyard in which Peter the Great worked as a ship-builder was closed in 1869. The victualing-yard, from which the navy is supplied with provisions, is the largest establishment of the kind in the kingdom. There are large marine engineering establishments and an extensive electric-light plant. Pop. (1901) 110,513.

Deputy [O. Fr. *depute* : Ital. *deputato* < Mediæv. Lat. *deputa'tus*, partic. of *deputa're*, (class. Lat.) prune down, (Med. Lat.) select, appoint as representative]: a person appointed to act for another as representative, lieutenant, viceroy, or agent; a delegate; a legislator chosen to represent his constituents. One of the legislative bodies of France under the monarchy (1814–48) was called the Chambre des Députés, which term is now applied to the lower house of the French National Assembly. In Italy the lower house is called Camera de' Deputati, Chamber of Deputies. It consists of about 500 deputies, elected by the people who pay taxes.

De Quincey, THOMAS: author; b. in Manchester, England, Aug. 15, 1785. He was a younger son of a wealthy merchant. He once ran away from school and went to London, where he passed nearly two months in extreme want and strange adventures. He entered the University of Oxford in 1803, and there contracted a habit of using opium. In 1808 he quitted the university, became a friend and associate of Coleridge, Southey, and Wordsworth, and began to reside at Grasmere in the lake district. He married in 1816, devoted his time chiefly to literature, made good translations from Lessing and Jean Paul Richter, and contributed articles on biography, philosophy, and other subjects to *Blackwood's Magazine*. When in the prime of life he overcame the habit of the excessive use of opium, and in 1821 he published *Confessions of an English Opium-eater*. He removed to Scotland in 1843, and passed the later years of his life near Edinburgh. He was one of the most brilliant magazine-writers of his time, and wrote on a great variety of subjects, but his works are mostly fragmentary. The first edition of his collected works was published in Boston (18 vols., 1851–58). D. in Edinburgh, Dec. 8, 1859. See Masson, *De Quincey* (1881).

Dera Ghazi Khan, der'a-gaă-zec'kaan': a town of the Punjaub, British India; on the river Indus, and 65 miles N. W. of Bhalpur (see map of N. India, ref. 4–B); in a large but thinly populated district of the same name, lying between the Indus and Suleiman Mountains. It is advantageously situated for trade, and has manufactures of silk and cotton goods and cutlery. Pop. 27,886 (one-half Mohammedan). Silk and woolens are manufactured here.

Derah (Arab. *deraa*): the unit measure of length in Egypt. The subdivisions are the *kadam* = one-half of a derah, the *abdat* = one-sixth of a derah, and the *kerat* = one-twenty-fourth of a derah. Several derahs are in use—viz., the common derah of Egypt = 22·37 British inches; the derah Hendazeh, by which dry goods are sold = 25·5 British inches; the derah Istambouli (Constantinopolitan derah), used for European dry goods = 66·34 British inches; and the ancient derah of the Nile or of Memphis = 20·699 British inches. The first three values above are given on the authority of the *Report of the International Conference on Moneys, Weights, and Measures* (Paris, 1867); and the last on that of Prof. Piazzi Smyth. This measure has some interest in consequence of its connection with discussions concerning the Great Pyramid of Egypt and the purpose of its construction.

Dera Ismail Khan, -ĕĕs-maă-eel'kaan': a town of the Punjaub, British India; in a very large district of the same name; on the Indus; 17 miles N. N. W. of Bukkur (see map of N. India, ref. 4–B). It has an active transit trade with Khorasan and manufactures of cotton cloth. Pop. 24,906.

Derajat, der-a-jaat': a division of British India; comprising the western part of the Punjaub between the Indus river and Afghan Mountains, with an almost equal territory between the Indus and the Jhelum, and including the districts of Dera Ismail Khan, Dera Ghazi Khan, and Bannu. It lies between lat. 28° 27′ N. and 33° 16′ N., and lon. 70°

15′ E. and 72° 3′ E. It is three-quarters uncultivable and largely devoted to grazing. The population is sparse for India, largely nomadic, and very largely Mohammedan. Area, 23,317 sq. miles. Pop. (1891) 1,650,380. M. W. H.

Derayeh, El, el-derī′e: a town of Arabia, in Nedjed; about 430 miles N. E. of Mecca; was formerly the capital of the Wahabees (see map of Persia and Arabia, ref. 6–E). It has a beautiful situation, with gardens and fertile fields in the environs. It was once a populous town, and contained about thirty mosques, but it was taken and partly destroyed by Ibrâhim Pasha in 1818. Pop. about 15,000.

Derbend′, or **Derbent′**: a fortified maritime town of Russia; capital of Daghestan; on the west shore of the Caspian Sea; lat. 42° N., lon. 48° 15′ E. (see map of Russia, ref. 12–H). It is situated at the foot of a mountain, and at the entrance of a defile called by the ancients *Albaniæ Pylæ*, and now the Pass of Derbend. To the south lies the seaward extremity of the great Derbend or Caucasian wall, known to the Turks as Alexander's wall, which originally had a height of 29 feet and a thickness of 10, and was provided with iron gates and watch-towers, forming a valuable defense of the former boundaries. The harbor is very ancient. It is poor and accessible only to small boats. In ancient times Derbend was a very important town. The Arabs established a khanate there in 728, and it was from time to time the dwelling-place of Haroun-al-Rashid, but in the course of succeeding centuries it changed masters many times. Peter the Great of Russia captured it from the Persians, who, however, subsequently regained it, but the siege of 1795 gave it again to Russia, with which it was formally incorporated by the treaty of 1813. Pop. 15,000.

Revised by M. W. Harrington.

Derby: a manufacturing town of England; capital of Derbyshire; on the river Derwent; at the junction of the main branches of the Midland Railway; 119 miles N. N. W. of London and 35 miles N. N. E. of Birmingham (see map of England, ref. 9–H). It is an old town, and during the Heptarchy was called *Northwothing*. Its present name, "Derby," or "Deoraby," was given to it by the Danes. It was incorporated by Henry I. Its charter was granted to it in 1683 by Charles II. Derby returns two members to Parliament. The private houses are built mostly of brick. Here is a free grammar school founded in 1162. Derby has manufactures of silk, cotton, lace, hosiery, porcelain of great beauty, jewelry, and ornaments of fluor-spar; also iron-foundries, rolling-mills, and tanneries. The chief industry is throwing silk. Pop. (1891) 94,146; (1901) 105,785.

Derby: city; New Haven co., Conn.; on both sides of the Naugatuck river, immediately above its junction with the Housatonic; on the N. Y., N. H. and Hart. Railroad; 9 miles W. of New Haven (for location, see map of Connecticut, ref. 11–F). It was formed by act of Legislature, taking effect Jan. 1, 1894, from the borough of Birmingham (*q. v.*) and the village of Derby. Pop. (1900) 7,930.

Derby, Earls of (England, 1485): Barons Stanley (United Kingdom, 1832), and baronets (1627). The Kings of Man were of this line from 1406 till 1505, when they took the title of lords of that island. The lordship of Man passed from the Derby family in 1735.—Edward Henry Smith-Stanley, fifteenth earl, P. C., D. C. L., formerly styled Lord Stanley, was born at Knowsley Park, July 21, 1826; educated at Trinity College, Cambridge, and elected to Parliament in 1848. He was one of the most liberal members of the Conservative party. In Feb., 1858, he entered the cabinet as Secretary for the Colonies, and in the ensuing May he became commissioner for the affairs of India. He retired from office when the Liberals came into power, in June, 1859. On the formation of a Conservative ministry by his father in June, 1866, he was appointed Secretary of Foreign Affairs. He presided over the conference of the European powers which was held in London in May, 1867. He resigned with his colleagues in Dec., 1868, and inherited the title of Earl of Derby in Oct., 1869; became Secretary of Foreign Affairs 1874, and resigned Mar. 28, 1878. He joined the Liberals 1880, and was Secretary for the Colonies 1882–85. He did not follow Gladstone in 1886 as a supporter of Home Rule for Ireland. D. Apr. 21, 1893, and was succeeded by his brother, Lord Stanley of Preston. —Frederick Arthur Stanley, sixteenth earl; b. in London, Jan. 15, 1841; represented Preston in the House of Commons 1862–65; Secretary of State for War 1878; and Secretary of State for the Colonies, and later President of the Board of Trade in Lord Salisbury's government; was Governor-General of Canada 1888–93.

Derby, Edward Geoffrey Smith-Stanley, Fourteenth Earl of: English statesman; b. in Lancashire, Mar. 29, 1799. He was educated at Oxford, was elected to Parliament in 1820, representing successively Stockbridge, Preston, Windsor, and North Lancashire, and became a master of the art of parliamentary debate. In 1825 he married a daughter of Lord Skelmersdale. He became Chief Secretary for Ireland in 1830 and supported the Reform bill, whose principles he had favored from the first. As Irish secretary he succeeded in carrying a coercion bill through the House in spite of the opposition of O'Connell, and brought in the first national education act for Ireland. In 1833 he entered the Whig ministry as Secretary for the Colonies, and while holding that office he used all the weight of his influence and the power of his eloquence in carrying through the measure for the emancipation of the slaves. He resigned office in 1834 because of the Government's position on the question of the Irish Church, whose surplus revenues it proposed to apply to educational purposes, a course which he characterized as plunder. So strong was his feeling on this subject, and so bitter his hostility to his former colleagues, that he abandoned the Whig party. He was Secretary for the Colonies in the cabinet of Sir Robert Peel from 1841 to 1845. Having been created Baron Stanley in 1844, he then passed into the House of Lords. He resigned office in 1845 because he was opposed to the repeal of the corn-laws, and soon after this date began to be regarded as the leader of the Conservatives and protectionist party. He stood in the foremost rank as a parliamentary debater. On the death of his father in 1851, he succeeded him as Earl of Derby. He was Prime Minister from Feb. to Dec., 1852, and was then succeeded by Lord Aberdeen. He was the leader of the opposition during the administration of Lord Palmerston, who resigned in Feb., 1858. Lord Derby then formed a new ministry, in which he was First Lord of the Treasury (Premier). This ministry is noted for the passage of the bill removing the disabilities from the Jews and of that transferring the control of India from the East India Company to the crown. He introduced a bill for electoral reform, but the House adopted an amendment offered by Lord John Russell. Lord Derby therefore dissolved Parliament and appealed to the country, but the Liberals obtained a majority in the new House of Commons which met in June, 1859, and Lord Derby then resigned office. He produced a translation of Homer's *Iliad* into blank verse (1867), which is highly commended. Russell and Gladstone, whose Reform bill had been rejected by the House of Commons, retired from power in June, 1866, and Lord Derby was then requested by the Queen to form a new ministry. He failed in his efforts to draw several Whig or Liberal leaders into a coalition. His principal colleague was Disraeli, who prepared a new Reform bill, passed in 1867, extending the right of suffrage to great numbers of the middle class. Lord Derby resigned in Feb., 1868, and was succeeded by Disraeli. D. Oct. 23, 1869.

Derby, George Horatio: officer and humorist; b. in Dedham, Mass., Apr. 3, 1823; graduated at West Point in 1846; and July 1, 1860, captain of topographical engineers. He served in the war with Mexico 1846–47; engaged at Vera Cruz and Cerro Gordo (severely wounded and brevet first lieutenant); on various surveys and explorations 1846–52; on improvement of San Diego harbor, Cal., 1853–54; on staff of commanding general and in charge of military roads department of the Pacific 1854–56; on coast survey 1856; and lighthouse engineer 1857–59. Under the *nom de plume* of "John Phœnix" he was author of *Phœnixiana* (1855); *Squibob Papers* (1859). D. in New York, May 15, 1861.

Derby, Orville Adelbert: geologist; b. at Kellogsville, N. Y., July 23, 1851. He studied at the State Normal School and subsequently at Cornell University, where he received the degree of M. S. in 1874. In 1870 and 1871 he had made brief trips on the Amazon. He was instructor in geology at Cornell from 1873 to 1875, when he resigned to take a place on the geological commission of Brazil. In 1878 the commission was dissolved, and its chief, Prof. C. F. Hartt, died soon after. Mr. Derby was appointed curator of the geological department of the National Museum, where he was engaged, among other things, in arranging and studying the rich material which had been collected by the geological commission. In 1885 he organized the geo-

graphical and geological commission of São Paulo, of which he is still the chief (1893). He has explored nearly every state of Brazil, and is the highest living authority on the geology and physical geography of that country. He has published several important papers on the geology, paleontology, etc., of Brazil, and has been employed in numerous scientific commissions by the Government. He is a fellow of the London Geological Society, and of numerous other scientific associations. HERBERT H. SMITH.

Derbyshire: an inland county of England; occupies nearly the center of the country, and has an area of 1,029 sq. miles. In the time of the Britons it belonged to the kingdom of the Coribani; under the Roman rule it formed part of *Britannia Prima*; in the period of the Heptarchy it stood under the Kings of Mercia. It is bounded E. by Nottinghamshire and Leicestershire, W. by Staffordshire and Cheshire, N. by Yorkshire and Cheshire, and S. by Leicestershire. Derbyshire is drained by the rivers Trent and Derwent. The county is remarkable for the great variety of its scenery, and is partly occupied by the Penine chain, formed of Carboniferous limestone. The Peak, the highest land in Derbyshire, has a summit, Kinder Scout, 2,082 feet in altitude. This county is rich in minerals—viz., coal, copper, iron, lead, zinc, etc. Here are manufactures of cotton, silk, and worsted goods, metallic wires, and porcelain. It is traversed by several canals and railways. Capital, Derby. Pop. (1891) 527,886; (1901) 604,577.

Derbyshire Spar: FLUOR-SPAR (*q. v.*).

Dercyl'lidas (in Gr. *Δερκυλλίδας*): a Spartan commander sent to aid the Asiatic Greeks in their resistance to the Persian forces under Pharnabazus and Tissaphernes, B. C. 399. He captured a number of cities in Asia Minor, and built a wall to protect the Greeks of the Chersonesus against the Thracians. He was superseded by Agesilaus, B. C. 396.

Der-el-Bahari: See EGYPT, ANCIENT.

Der-el-Medineh: See EGYPT, ANCIENT.

Der'embourg, HARTWIG: French Arabist; b. in Paris, June 17, 1844; since 1885 Professor of Arabic in the Collège de France. He has published the Arabic texts of Jawālīki and Ibn Jānāh, and numerous dissertations on Arabic and Sabean subjects. C. H. TOY.

Derembourg, JOSEPH: father of Hartwig Derembourg; Hebraist and Arabist; b. in Mayence, Germany, in 1811; since 1852 a resident of Paris. He has published editions of Lokman and Hariri, *The History of Palestine from Rabbinical Sources* (1867); two Hebrew versions of Dimna and Kalila, and, in conjunction with his son, *The Sabean and Himyaritic Monuments of the Louvre* (1886). C. H. TOY.

De Reszké, EDOUARD: See the Appendix.

De Reszké, JEAN: See the Appendix.

Derg, Lough (Red Lake): an expansion of the river Shannon, in Ireland; between Tipperary, Galway, and Clare; 24 miles in length and averaging 2 miles in width. The same name is given to a small lake of Ireland between Donegal and Tyrone. It incloses an isle, the reputed entrance to St. Patrick's Purgatory, which is visited annually by many devotees, and was long the most celebrated place of pilgrimage in Ireland.

Derived Function, or **Derivative**: a term first used by Lagrange in his *Calcul des Fonctions* to indicate the coefficient of h in the development of a function $F(x + h)$ according to powers of h. It is itself a function of x, and is usually represented by the symbol $F'(x)$. In a similar manner the derived function of $F'(x)$ is termed the second derived function of $F(x)$, and is denoted by the symbol $F''(x)$.

Dermap'tera (see DERMOPTERA): a name frequently given to the order of insects known as *Euplexoptera*. See FORFICULIDÆ.

Dermatology: the branch of medical science which treats of SKIN DISEASES (*q. v.*).

Dermat'ophytes [from Gr. *δέρμα, δέρματος*, skin + *φυτόν*, plant, growth]: cryptogamic vegetable growths which inhabit the cuticle or epidermis, and give rise to certain skin-diseases, such as favus, ringworm, etc. It is held that the various forms of these plants are in many cases transmutable into each other. For example, the favus plant, the barber's-itch plant (*Achorion*), and the chloasma plant (*Microsporon*) are only forms of the yeast plant (*Torula* or *Cryptococcus cerevisiæ*).

Dermes'tes [from Gr. *δέρμα*, skin + *ἐσθίειν*, eat]: a genus of small dull-colored beetles of the family *Dermestidæ*, whose larvæ feed upon dry animal substances, such as skin, horn, and feathers. *Dermestes lardarius* (the bacon beetle) and *D. maculatus* are among the most active and dangerous of museum pests, attacking all manner of dried animal preparations that have not been poisoned. The larva of a related species, a small steel-blue beetle (*Anthrenus museorum*) is particularly given to destroying the beaks and nails of birds. F. A. LUCAS.

Dermop'tera [from Gr. *δερμόπτερος*, having membranous wings (as a bat); *δέρμα*, skin + *πτερόν*, wing]: a sub-order of insectivorous mammals, distinguished by a fold of skin extending from the wrist to the ankle, and thence to the tip of the tail. See FLYING LEMUR and INSECTIVORA.
F. A. LUCAS.

Dermoskeleton [from Gr. *δέρμα*, skin + *σκελετόν*, skeleton, neut. of *σκελετός*, dried up, withered (sc. *σῶμα*, body); cf. *σκέλλειν*, to parch]: the crustaceous, testaceous, or osseous integument which covers many invertebrate animals, as the beetle and lobster; also some vertebrate animals, as the tortoise. It serves to protect the soft parts of the body, and affords points of attachment for the organs of locomotion.

Der'ne, Der'na, or **Bel'ed-al-Soor** (anc. *Darnis*): a seaport-town of Northern Africa; in Barca; a mile from the Mediterranean; lat. 32° 46′ N., lon. 22° 41′ E. (see map of Africa, ref. 2–E). Its harbor is insecure, and its general prosperity is decreasing. During the hostilities between the U. S. and Tripoli this town was taken in 1805 by the forces under Gen. Eaton. Pop. about 6,000.

De Rosny, *de-rō'nee'*, LÉON: Japanese and Chinese scholar; b. Apr. 5, 1837; professor in the School of Living Oriental Languages at Paris. He has published a history of the yellow race, a Chinese grammar, a Japanese anthology, and many dissertations on the peoples and the civilization of the extreme Orient. C. H. TOY.

Déroulède, *dā'roo'lād'*, PAUL: politician; b. in Paris, Sept. 2, 1846; studied law; a volunteer in the campaign of 1870; was wounded at Sedan, but escaped into Belgium. His *Chants du soldat* (1872) and *Nouveaux chants du soldat* (1875) attracted much attention, especially on account of their intense anti-German spirit, and ran through many editions. His *l'Hetman*, a drama in five acts and in verse, also proved a success (1877). But within the next few years his reputation rested mainly on his political activity, while chief of the Patriotic League, an organization that appealed directly to the patriotic devotion of all citizens. In 1884, when Boulanger became Minister of War, Déroulède, who was his stanch supporter, sought by all the means in his power to further a vigorous foreign policy and excite anti-German feeling. He was conspicuous in the presidential crisis of Dec., 1887, attacking the financial scandals of the Élysée. The power of the league showed itself in the election of Jan. 27, 1889, which gave him an enormous majority as deputy. The Government then suppressed the league. After the condemnation of Boulanger, Déroulède continued to be his defender, and in Sept., 1889, was elected a Boulangist deputy; re-elected in 1898. An extreme revisionist, he is usually a bitter antagonist of the Government, and holds that the President should be elected by popular vote. Other works by him are *De l'Éducation nationale* (1882); *Monsieur le Uhlan et les Trois couleurs* (1884); *Refrains militaires* (1888); and *Histoire d'Amour* (1890).

Derqui, SANTIAGO: politician; b. at Cordova, Argentine Republic, about 1810. In the political struggles which followed the revolution he adhered to the *Unitario* party, the aim of which was to bring the Platine states under one government. In 1842 he was at the battle of Caaguazú, and in 1846 he was banished by Rosas. After the fall of Rosas he was a member of the constitutional congress of the provinces at Santa Fé (1853); subsequently minister under Urquiza, and finally president of the Argentine Confederation (not including Buenos Ayres) after the retirement of Urquiza (1860). The struggle with Buenos Ayres continued, and the army of the confederation was finally beaten by Gen. Mitre at Pavon, near Buenos Ayres, Sept. 17, 1861. The result was the formation of a new constitution, and Derqui retired to Corrientes, where he died soon after.
HERBERT H. SMITH.

Derrick [so named from Derick, originally an abbreviation of Theodoric, or Derrick, a celebrated hangman at Ty-

burn in the seventeenth century]: a kind of crane or apparatus for lifting and transporting to short distances heavy weights, such as stone in a quarry. It usually consists of a tall mast supported on a pin, on which it may revolve, the pin being journaled in a hole in a large stone sunk in the ground, held steady by several guy-ropes or rods, and provided with a boom hinged near the bottom of the mast, which may be raised or lowered by suitable rope-tackle, the blocks of which are fastened respectively near the top of the mast and near the outer end of the boom. A tackle also depends from the outer end of the boom, by which the load is carried. The tackle-ropes are operated by suitable wheel gearing fastened near the bottom of the mast.

Dervishes [from Pers. *derwēsch*, mendicant, beggar]: an order or sect among the Mohammedans, resembling in some respects the monkish orders of the Roman Catholic Church and the mendicant friars, and having in some particulars a resemblance to the Freemasons of mediæval Europe. The name corresponds to the Arabic *fakir*, by which term the order, or at least the inferior portion of it, is known in India and Arabia. The order is also described by the terms *santon* and *sûfi*, which latter term Sir John Malcolm uses in his *History of Persia*.

The dervishes constitute a large part of the population in Western and Central Asia and in Northern and Eastern Africa. The origin of the order is involved in a good deal of obscurity. It is clear that the leading philosophical and religious ideas on which the order is based had been long and widely prevalent before there was any formal organization. They endeavor to trace their origin to the caliph Ali, one of the immediate successors of Mohammed. There is no clear proof of the existence of the sect in definite form earlier than the twelfth century.

This order has both a religious and a philosophical basis. At the center of its philosophy is the idea that the soul is an emanation from God, and that man's highest aim is to seek a total absorption in the Deity. On their surface the tenets of the higher grades of the order appear to be of a pure and exalted character. They partake largely of the mysticism prevalent among the Hindus, and have striking analogies with those of the Pythagoreans.

The dervishes are an ascetic order, and practice very austere rites and ceremonies. But the membership does not involve the giving up of private property or entire seclusion from the world; and many of them are engaged in trade, and some are allowed to marry. The various and, to us, strange rites and ceremonies in vogue among them are only different ways by which they seek for union with and absorption in God. They claim that in these exercises they may in time become endowed with miraculous powers; and their books teem with wonderful stories of feats of mind-reading and mesmerism performed by them in the ecstatic conditions into which they are brought by these exercises. The feats that they perform as a part of their religious service—thrusting swords and knives into their flesh, eating glass, and swallowing fire—seem little less than miraculous. Their chief religious exercise is the performance of the "zikr," which is a repetition in many different ways of the name and attributes of God, accompanied with violent exertion of arms and head and of the whole body, with intense mental strain. This is practiced often and for a long time, until the bodily powers are exhausted, and often a condition of catalepsy induced. The merit of the exercise depends upon its severity and the length of its continuance.

While the dervishes are Moslems, their doctrines differ widely from the faith of Mohammed. The Moslems in general think of religion as having little to do with personal character, it being with them mainly a means of escaping from perdition; the dervish, on the other hand, values religion as an aid in gaining deliverance from the dominion of sin. There are among the dervishes many sects or classes having more or less clearly marked peculiarities. The chief distinction is between those who are definitely organized and settled in convents, where they observe prescribed rites and give themselves to meditation and penance, and those who are unorganized, but still engage more or less in the appointed rites and ceremonies. These convents are endowed with lands which are incapable of alienation, and are otherwise the recipients of large gifts.

It is one of the traditions of the dervishes that at the first there were only two orders among them, and that afterward twelve orders arose, one from each of the twelve imams who succeeded the first caliphs. The best-known and most distinctly marked of the orders in Turkey are the Mevlevi, or whirling dervishes, and the Bedevi, or howling dervishes. Besides these there are a number of other classes, variously stated at thirty to one hundred. This uncertainty as to their number may be taken as proof that they do not exist, or that they are very imperfectly organized.

There are many dervishes who have no connection with any regular organization and no fixed abode. They go from place to place in search of employment, or are simply mendicants; and in their trade they display great skill and effrontery, often demanding aid in such a way that refusal is impossible, or at least dangerous. And so they have come to be both respected and feared.

In the early times the higher orders of the dervishes had chiefly and decidedly a religious character, but for a long period they have wielded a powerful social and political influence, and at times they have been a dangerous power in the state. As they acknowledge no authority but that of their spiritual guides, and do not accept the interpretation which the ordinary tribunals put upon the letter of the Koran, the sultans have always regarded them with jealousy. In 1826 the Sultan Mahmoud II., seeing what they were doing, and apprehending more serious trouble, put to death some of the chiefs, and attempted to destroy the order. There followed, however, a reaction, and the order in a short time regained its influence. See Madden, *The Turkish Empire* (London, 1862); Malcolm, *History of Persia* (London, 1829); Lane, *The Modern Egyptians* (London, 1836); Brown, *The Dervishes* (Philadelphia, 1868); Hughes, *Dictionary of Islam* (London, 1885). JOHN EDMANDS.

Dervish Pacha, dĕr'vish-pā'shaa': Turkish general and diplomatist; b. 1817 at Eyoub, Constantinople; sent to England and France to study engineering by the Government: filled various professional and diplomatic positions; appointed commander of all the military schools of the Turkish empire 1855; director of the administration of mines and forests 1861; defended Batoum against the Russians 1878; suppressed an insurrection of Albanians 1880–81; agent of the sultan to Egypt 1882. C. H. THURBER.

Der'wentwater, also called **Keswick Lake**: a beautiful lake of England; in Cumberland; an expansion of the river Derwent. It extends southward from Keswick; is 3 miles long and 1 mile wide. It is 238 feet above the level of the sea. On this lake is a floating island, covered with vegetation and full of air-bubbles, which render it buoyant. See DERWENTWATER, FLOATING ISLAND OF, in the Appendix.

Derwentwater, JAMES RADCLYFFE, Earl of: an English Roman Catholic and Jacobite; b. in Northumberland, June 28, 1689. He inherited the earldom from his father in 1705. In 1715 he raised a small body of his retainers to fight for the Pretender. He was one of the leaders of the army that was defeated at Preston (Nov. 13), and was taken prisoner. He was convicted of treason, and beheaded Feb. 24, 1716. His estates were given to Greenwich Hospital.

Derzhavin, der-zhaa'vin, written also **Derzavin**, or **Derjavine**, GABRIEL ROMANOVITCH: lyric poet; b. at Kazan, Russia, July 3, 1743. He entered the army in 1762, and was raised to the rank of colonel. Having gained the favor of the Empress Catharine, he was appointed secretary of state in 1791. He became a senator in 1793, imperial treasurer in 1800, and minister of justice in 1802. In 1810 he published four volumes of poems, remarkable for originality, sublimity, and for purity of sentiment. His most popular poem is an *Ode to the Deity* (*Oda Bogu*), which has been translated into English, Chinese, and other languages. His works were published in five volumes in St. Petersburg (1810–15). D. July 6, 1816.

Desaguadero, dā-saă-gwaă-dā'rō: a river of Bolivia. See TITICACA.

Desaguadero: a river of Central America. An old name for the San Juan. See NICARAGUA.

Desaix de Veygoux, de-sā'de-vā'goo', LOUIS CHARLES ANTOINE: general; b. near Riom, Auvergne, France, Aug. 17, 1768. He served with distinction in several campaigns of the army of the Rhine, and was rapidly promoted to the rank of general. In 1798 he took part in the expedition to Egypt. He gained a victory at Sidiman in October of that year, and completed the conquest of Upper Egypt in 1799. He afterward governed that province with such moderation and justice that the natives called him "The Just Sultan." In May, 1800, he returned to France, and hastened to join the army in Italy. The French were about to retreat at

Marengo, when Desaix arrived with a reserve, and converted defeat into a decisive victory, but he was killed in this action, June 14, 1800. See J. Lavallée, *Éloge historique du Général Desaix*; Thiers, *History of the Consulate*.

De Sanctis, Francesco: scholar and statesman; b. in Italy in 1818. He was educated in Naples, and there began his career as teacher or professor. This was always his natural calling, yet it was hard in the troubled days of the fifties for an Italian to avoid the complications of politics. De Sanctis had opinions, and the result was three years' imprisonment (1850–53). After his release, he taught for a time in Turin, then in Zurich, returning to Naples in 1860. Here in 1862 he became professor in the university, founding at the same time the journal *L'Italia*. He will be longest remembered for his *Storia della letteratura italiana* (2 vols., 1870). D. at Naples, Dec. 29, 1883. A. R. Marsh.

De Sanctis, Luigi: a leader of the Protestant movement in Italy; b. in Rome, Dec. 31, 1808; was for some years a priest (1831) and Professor of Theology in Rome; became a Protestant in 1847; was in 1864 appointed Professor of Theology at the Waldensian Seminary in Florence, and established there the Protestant periodical *Eco della Verità*. He wrote a number of treatises against the Roman Catholic Church, which have been translated into several languages. D. in Florence, Dec. 31, 1869. See the anonymous *Life* of him (Florence, 1870).

Desaulniers, dā'sōl'ni-ā', François Severe Lesieur: journalist; b. at Yamachiche, P. Q., Canada, Sept. 19, 1850; educated at Nicolet College, and admitted to the bar in 1879. He has been editor of *Le Constitutionnel*, *Le Canadien*, *Le Foyer Domestique*, *Le Messager de Nicolet*, and *Le Journal des Trois-Rivières*. He was a member of the Legislative Assembly of Quebec 1878–86; entered the Dominion Parliament in 1887, and was re-elected in 1891.

Neil Macdonald.

Desbrosses, dā'brŏs', Jean: landscape-painter; b. in Paris, May 28, 1835. Pupil of Ary Scheffer and Chintreuil; second-class medal, Salon, 1887; third-class, Paris Exposition, 1889. He usually paints sunlight effects on summer landscape motives. Studio in Paris. W. A. C.

Descartes, dā'kaart', René: philosopher and mathematician; b. at La Haye, in Touraine, France, Mar. 31, 1596; educated at the college of La Flèche, where he acquired great proficiency in mathematics and astronomy, and formed an intimate friendship with Mersenne. He left college in 1612, dissatisfied with the method and doctrines which were then in vogue. He resolved to efface from his mind all scholastic dogmas and the prejudices of his education, to reject the authority of books, and to admit only that which was confirmed by reason and experiment. He entered the Dutch army in 1616, and that of the Duke of Bavaria in 1619, but renounced the military profession in 1621. In pursuit of knowledge he traveled for several years in Italy, France, and other countries. He settled in Holland in 1629, in order to devote himself to the study of mathematics, astronomy, metaphysics, etc. He made important discoveries in algebra and geometry, which he announced in his *Discourse on the Method of Reasoning Well and of Investigating Scientific Truth* (*Discours de la Méthode pour bien conduire la Raison*, etc., 1637). This work comprises treatises on metaphysics, dioptries, and geometry. He was the first who introduced exponents or applied the notation of indices to algebraic powers, and he gave a new and ingenious solution of equations of the fourth degree.

He published in 1641 *Meditationes de Prima Philosophia*, which gave a wonderful impulse to philosophical inquiry. He founded the superstructure of all positive knowledge on the basis of self-consciousness, or the relation between consciousness and existence, which he expressed in this phrase: *Cogito, ergo sum*—I think, therefore I exist. He worked a greater change in metaphysical thought than any modern philosopher. The innovations and paradoxes of the Cartesian philosophy excited much hostility among the theologians and the disciples of Aristotle. His book was condemned by the college of cardinals at Rome. Among his other works is *Principles of Philosophy* (*Principia Philosophiæ*, 1644), in which he propounds his theory of the world —that the sun is the center of a *vortex* of an ethereal fluid, whose whirling motion produces the revolution of the planets and other phenomena. The French court granted him a pension of 3,000 livres in 1647. Having been invited to her court by Christina, Queen of Sweden, he went to Stockholm in 1649, where he died, Feb. 11, 1650. Complete editions of his works were published in 1690 and 1824. See *The Method, Meditations, and Selections from the Principles of Descartes*, translated by John Veitch; a translation of the *Meditations*, by W. R. Walker in *Jour. Spec. Philos.*, vol. iv.; Kuno Fischer, *Geschichte der Neueren Philos.*, bd. i.; Adrien Baillet, *Vie de Descartes* (2 vols., 1691); Thomas, *Éloge de Descartes* (1765); G. H. Gaillard, *Éloge de Descartes* (1765); Millet, *Descartes, sa Vie*, etc. (1869).

Descartes's Rule of Signs: a theorem by means of which the maximum number of positive or negative roots of an equation can be ascertained by inspection. The theory reduces itself essentially to this: The number of positive roots of an equation can not exceed the number of variations in the signs of its coefficients, considered in their proper order. As an illustration, take the cubic equation $F(x) = 3x^3 - 7x^2 + 11x + 4 = 0$. Inasmuch as there are but two variations of signs on passing from one extreme term to the other, through the intermediate ones, we conclude that the cubic can not have more than two positive roots. To ascertain the maximum number of negative roots, it is merely necessary to apply the same theorem to the equation which is obtained from the original by changing x into $-x$. Thus the positive roots $F(-x) = -3x^3 - 7x^2 - 11x + 4 = 0$ are negative roots of the original cubic, and by Descartes's rule their number can not exceed one. This rule is a particular case of Fourier's theorem.

Descent: in law, the succession to landed estate after the owner's death, in cases where he has not made previous disposition of the estate. The rule of descent among the ancient Greeks was that the sons shared alike, and the daughters were dependent upon the bounty of their brothers. Among the Hebrews the eldest son had a double portion. With the ancient Romans sons and daughters shared alike. The former English law was very complicated, but has of late received important modifications. The law of primogeniture prevails as to males, while several females of equal degree claim as one heir.

The subject of descent is regulated by positive rules in the U. S., and but few of general application can be stated. The following may be referred to as either of common recognition or having some peculiarity worthy of notice:

1. Title by descent depends upon a rule of law. The person from whom the land descends is termed an ancestor; the one to whom it passes is called an heir, who has no volition in the matter. The estate is cast upon him, at the death of the ancestor, even against his consent.

2. The persons to whom land descends are specifically designated by positive rule, and may be grouped as follows: (1) Lineal descendants. These, if of equal degree, take equally undivided shares or are "tenants in common." If of unequal degree, those who are more remote take the share that would have belonged to their parent if living. Thus if the ancestor had left a son A, and C, D, E, children of a deceased son B, the grandchildren taken together would have the share of B. Those who inherit on equal terms are said to take *per capita*; those who take the shares of deceased persons, as above illustrated, are said to take *per stirpes*. (2) Where there are no descendants, the next claimants would regularly be the parents (the father being frequently preferred to the mother), as they are removed but one degree from the intestate, while the nearest collateral relatives (brothers and sisters), reckoning according to the methods of the civil law (see Consanguinity), are two degrees. Still, if the estate descended to the intestate from maternal relatives, there are cogent reasons for preferring the brothers and sisters to the father, and the same reasons for preferring them to the mother where the land came from paternal relatives. Under these circumstances the law of some of the States gives the land to the father or mother for life only, as the case may be, and the estate itself to the brothers and sisters. (3) If there be no father or mother or descendants, the land will descend to the brothers and sisters equally, with the same distinctions as to taking *per capita* and *per stirpes* as noticed under subdivision (1). (4) The next claimants are either grandparents, or, if these be passed over, as may be the case, uncles and aunts and their descendants. In the instance of uncles, etc., the law of some of the States distinguishes between the case where the intestate acquired the estate by his own act and where he obtained it by inheritance. In the former instance the descent would take place to maternal and paternal uncles and aunts and their descendants, without discrimination;

in the latter, the uncles, etc., belonging to that branch of the family from which the estate was derived would have the preference. More remote claimants need not here be noticed. (5) Distinctions sometimes are recognized between relatives of the whole blood and those of the half blood, so that the latter are excluded from inheriting. An illustration is found in the law of New York, under which, for example, a brother of the half blood on the maternal side (*frater uterinus*) can not inherit land from a brother having a different father, which land such brother had inherited from his father, as the claimant is not in that case of the blood of the immediate ancestor from whom the estate was derived by the brother from whom inheritance is claimed (*Wheeler* vs. *Clutterbuck*, 52 New York Reports 67, 1873). (6) Posthumous children inherit as if they had been born during the life of the ancestor. They must be born alive, and of such a state of development that by the laws of physiology they are capable of living. (7) The English common law will prevail unless abrogated by statute. Thus in New York, where the special cases referred to in the statute of descents do not occur, primogeniture still is recognized.

3. Illegitimate relatives can not in general inherit, though in a number of the States they may under certain qualifications, particularly from the mother and maternal relatives.

4. The law of the State where the land is situate governs descent, without reference to the law prevailing where the owner resides.

5. In general, all interests in and rights to land are governed by the rules of descent. Thus should the intestate have only a right of action, or be the owner of a future estate, or have simply a beneficial ownership, such as an estate held in trust, his rights and qualified estates of this nature will be transmitted under the same general rules as if he were legal owner in possession. This proposition is in some respects in marked contrast with the doctrines of the common law. This system required the ancestor to have been at some time seized or to have an estate of which seizin could be affirmed. (See SEIZIN.) Accordingly, if he had acquired only a right of action, this could not descend from him, nor could in general an estate of which he had acquired the ownership, subject to a life estate in another. Still, if he had once been seized, the unlawful deprivation of his seizin would not prevent the operation of the law of descent.

6. In a number of the States aliens can not inherit. This is a rule of the English common law. In other States it has been abrogated. T. W. DWIGHT.

Deschambault, dā-shăăm-bō′: town of Quebec, Canada; in Port Neuf County, and on the St. Lawrence river. It is a railroad station, 39 miles S. W. of Quebec. See map of Quebec, ref. 4–D. Pop. 1,456.

Deschamps, dā′shăăñ′, ÉMILE: poet and dramatist; b. at Bourges, France, Feb. 20, 1791. He produced in 1818 two successful comedies, entitled *Selmours et Florian* and *Le Tour de Faveur*, and took position in the literary world as one of the most ardent champions of the Romantic movement. In 1828 he published a volume of poems called *Études françaises et étrangères*. He contributed to the journals some prose tales and a great number of critical articles. He also translated *Romeo and Juliet* and *Macbeth*. D. Apr. 23, 1871.

Deschamps, EUSTACHE, entitled *Morel* during his life: poet; b. at Vertus, in Champagne, France, in 1328; has an important place among the artificial versifiers of the end of the fourteenth century. He chiefly produced *ballades*, *rondeaux*, *virelais*, and similar forms of verse. Still we have by him a poem of 13,000 lines, entitled *Miroir de Mariage*, and an *Art of Poetry* (*Traictié de l'art de dicter*), which has much interest for the student of French verse. D. about 1410. The edition of the works edited by the Marquis de Queux de Saint-Hilaire for the Société des Anciens Textes Français is not yet complete (1892). See A. Sarradin, *E. Deschamps, sa vie et ses œuvres* (1880). A. R. MARSH.

Deschanel, dā′shăă′nel′, ÉMILE AUGUSTE ÉTIENNE MARTIN: author; b. in Paris, Nov. 14, 1819; published in 1850 *Catholicisme et Socialisme*, and articles for the republican press which caused his banishment. Returning in 1859, he became an editor of the *Journal des Débats*; in 1881 he was made Professor of Modern French Literature in the Collège de France. He printed *Les Courtisanes de la Grèce* (1854); *Histoire de la Conversation* (1858); *Physiologie des écrivains et des artistes* (1864); *Études sur Aristophane* (1867); *Le Romantisme des classiques* (1882); *Racine* (2 vols., 1884); *Pascal, La Rochefoucauld, Bossuet* (1885); *Le Théâtre de Voltaire* (1886); *Boileau, Charles Perrault* (1888).

Revised by A. R. MARSH.

Descht: a river of Baluchistan; enters the Arabian Sea in lat. 25° 15′ N., lon. 61° 50′ E. It is nearly 900 miles long, but is shallow in all parts of its course.

D'Esclot, Esclot, or **Sclot**, BERNAT: Catalan historian, whose *Chronicle* was first published in the original text by Buchon, together with a translation of Muntaner and other matter in his *Collection* of *Chroniques étrangères relatives aux Expéditions françaises pendant le XIII^e^ Siècle* (Paris, 1841, 8vo). The years of D'Esclot's birth and death are unknown, but his *Cronica del Rey En Pere e dels seus antecessors passats* appears to have been composed in 1285. This work has not the fervor, the "wrath and partiality," of Muntaner's chivalric narrative, but it is not therefore less trustworthy; and it often contains piquant details which Muntaner sacrificed to his rhetoric. D'Esclot's is the oldest historical composition of any moment which remains to us from the early stage of the Catalan language, and it is therefore of great linguistic as well as literary interest.

Descriptive Geometry: See GEOMETRY, DESCRIPTIVE.

Deseada: island of the West Indies. See GUADELOUPE.

Deseret′, University of: a collegiate institution of Salt Lake City, U.; incorporated in 1850 by the assembly of the provisional State of Deseret. In Nov., 1850, it was opened for the reception of students under the supervision of Orson Spencer, A. M. Owing to a lack of patronage the school was discontinued till 1867, when, under David O. Calder, it was started as a commercial college. In 1869, under the presidency of John R. Park, M. D., scientific, classical, and normal departments were added to the commercial, and in 1870 an academical department was established, as well as a model school. A deaf-mute department was established in 1884. Both sexes are admitted to the university.

Deseron'to: town (founded in 1850); Hastings co., Ontario, Canada (for location, see map of Ontario, ref. 3–G). It is connected with the Grand Trunk and Canada Pacific R. R. by a branch line, and is situated on the Bay of Quinte, 130 miles W. of Toronto. Deseronto has four churches, high school, extensive lumber-mills, sash and door factory, terra-cotta works, car and locomotive shops, flour-mills, brick-yard, distilling works, etc. Pop. (1880) 1,670; (1890) 3,388; (1893) estimated, 4,000.

EDITOR OF "TRIBUNE."

Deserts [O. Fr. *desert*: Ital. *deserto*: Span. *desierto* < Lat. *deser′tum*, plur. *deser′ta*, uninhabited land, *deser′tus* pte. of *dese′rere*, abandon]: barren land areas, determined by aridity, cold, or the absence of soil. They are commonly thought of as dry plains, but they may possess great variety of form, including all areas scantily occupied by or free from animal and plant life. The barren rocks and snows of mountain summits, the icy plateau of Greenland, the fresh lava flows of volcanic districts, and the salt-beds of extinct lakes may all be included with arid lands under the general term desert.

The dryness by which arid deserts are produced depends on three things: 1. Mountains inclosing the region from moist winds. Thus the deserts of the western basins of Nevada, Utah, and Arizona are sheltered by the Sierra Nevada from the vapor-bearing winds of the Pacific; the mountains that rise above these deserts may have rain or snow enough to support forest growth at high levels, but the intervening plains are extremely barren. The great interior basins of Asia are inclosed on all sides by mountains which receive rain from the oceans on their outer slopes; streams descend from the mountains to the inclosed basin, supporting small settlements where they emerge from their steeper valleys, and then dwindling away as they advance across the sandy wastes. 2. The occurrence chiefly or exclusively of warming winds; that is, of winds which flow toward the equator, warming as they advance and yielding no rain. Thus the great Sahara lies chiefly under the N. E. trade winds; its northern margin receives light rains in winter, when cyclonic storms pass by from the Atlantic; the southern margin has rain in summer, when the equatorial rain-belt migrates north; but the central area has no rains except where its mountains rise high enough to provoke precipitation. The deserts of Atacama on the west coast of South America and of Lower California are dry

even though near the ocean, because their winds blow equatorward. 3. Distance from the ocean, even though not inclosed by mountains. The deserts and steppes of the Aralo-Caspian region may be reached by Atlantic winds crossing the lowlands of Central Europe, but the overland distance is so great that most of the vapors brought from the sea fall as rain on the way.

The form of arid deserts varies greatly; from unbroken plains, as the beds of extinct lakes or seas in Utah, Nevada (see BONNEVILLE and LAHONTAN), and Australia, to sandy and stony plateaus much diversified by high and low land, as over the greater part of the Sahara. The former action of running water, indicative of a moister climate, is clearly proved by the dried valleys or wadies which traverse the Sahara, where they are often followed as caravan routes; but the present agent of greatest geological change is the wind, by which the finest dust is blown far away, even to the ocean, and the sand is drifted about obliterating rather than forming valleys, carving the rocks, and heaping up dunes several hundred feet high. See ARID REGION, DUNE, OASIS, and SAHARA. W. M. DAVIS.

Desfontaines, dā′fōn′tān′, RENÉ LOUICHE: botanist; b. at Tremblay, Ille-et-Vilaine, France, in Feb., 1750. Among his published works were *Flora Atlantica* (2 vols. 4to, 1798), which treats of the plants of Africa, and *Description of the Trees and Shrubs of France*. D. Nov. 16, 1833.

Desgenettes, dā′zhe-net′, NICOLAS RENÉ DUFRICHE, Baron: physician; b. at Alençon, France, May 23, 1762. He was chief physician of the army of Italy in 1795–96, in Egypt 1798; was physician to the grand army during the empire, and at the battle of Waterloo. He lost his position at the Restoration. He wrote, besides other medical works, *The Medical History of the Army of the East* (1802). D. Feb. 3, 1837.

Desgoffes, dā′gŏf′, BLAISE ALEXANDRE: still-life painter; b. in Paris, Jan. 17, 1830. Pupil of Flandrin; second-class medals, Salons, 1863 and 1878; third-class medal, Paris Exposition, 1889. Many of his paintings represent groups of splendid objects of art, ivories, bronzes, enamels, lapis-lazuli vases, and the like. *Amethyst Vase* and *Crystal Vase and other Objects* are in the Luxembourg Gallery, Paris. Studio in Paris. W. A. C.

Deshnef, SIMEON: See the Appendix.

Des'iccant [from Lat. *desic'cans*, pres. ptc. of *desicca're*, to dry anything up; *de.* off + *siccus*, dry]: in medicine, an application used to check secretion of a membrane or ulcer.

Desiccation: a process of extracting moisture by chemical agency or by the use of air and heat. Fused calcium chloride, quicklime, fused potassium carbonate, and sulphuric acid are used for this purpose.

Desiderio (Da Settignano): See SETTIGNANO.

Designs: See the Appendix.

Desima: a very small artificial island in the Bay of Nagasaki, Japan, shaped like a fan. In the early history of European relations with Japan the Dutch were the only people admitted, and they were confined to this island and subjected to many indignities.

Desire: See the Appendix.

Desjardins, dā′zhaar′dăn′: a sculptor, whose real name was MARTIN VAN DEN BOGAARD; b. in Breda in 1640. In 1670 he went to Paris, and in 1671 presented to the Academy a bas-relief representing Hercules crowned by Glory, and two other works. These caused his election into the Academy. He executed the equestrian statue of Louis XIV. for the city of Lyons, his first and finest work of this size. In the vestibule of the church of the Mazarin College he sculptured the Evangelists and the Fathers of the Church in six groups; these were destroyed in the Revolution; he produced the marble statue of *Evening* for the park of Versailles, and finished Lefevre's *Artemis*. He was commissioned to erect a statue to Louis XIV. on the Place de la Victoire in Paris, for which he was paid a million francs; this was also destroyed in 1792. D. in 1694. W. J. S.

Desjardins, ALPHONSE: member of Canadian Parliament; b. at Terrebonne, P. Q., May 6, 1841, and educated at Masson College. He was admitted to the bar in 1862; in 1868 forsook law for journalism, and has edited *L'Ordre* and *Le Nouveau Monde* newspapers. He was one of the organizers of the Canadian papal zouaves sent to aid the Pope in 1868; one of the authors of the *Programme Catholique* 1871; and was created a knight of the order of Pius IX. in 1872. He entered the Parliament of Canada in 1874, and has been re-elected at every subsequent election up to and including that of 1891. NEIL MACDONALD.

Desman [Swed. *desman-ratta*, musk rat]: the common name for the two species of musk shrews. The Russian desman (*Myogale moschata*) is about 8 inches long, exclusive of the tail, which is as much more. The fur is soft, brown, and glossy, the hind feet long and webbed, the tail naked and vertically flattened. In fact, but for its long, slender nose, the desman, although an insectivore, bears a strong external likeness to a small musk rat. It inhabits the lakes and rivers of Southeastern Russia, and feeds on aquatic insects. The Pyrenean desman (*M. pyrenaïca*), so named from its habitat, is smaller, and has a round tail. See TALPIDÆ. F. A. LUCAS.

Desmids [from Gr. δεσμός, chain + εἶδος, form]: microscopical, single-celled, fresh-water algæ (*Desmidiaceæ*), numbering about 1,100 species. In many ways they remind one of the Diatoms, but they have true chlorophyll, and their walls are not silicified. In shape they vary from fusiform to cylindrical and disk-shaped, and are often much constricted at the middle. In some cases they have the power of movement, somewhat as in Diatoms; but it is not known whether the mechanism is the same or not.

They reproduce by splitting (fission), and by a sexual process (conjugation). In the former the neck joining the two halves elongates, and divides by a partition (Fig. 1), producing two unsymmetrical individuals. By subsequent growth of the smaller lobes the two desmids soon become

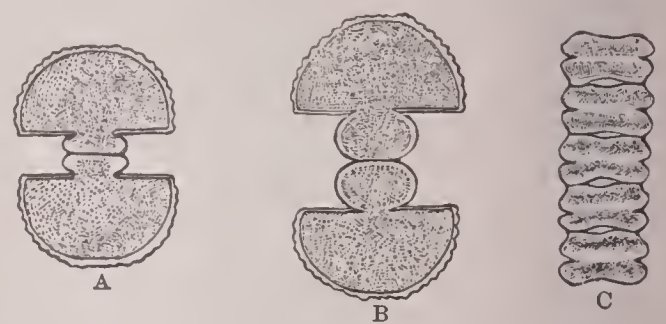


FIG. 1.—A, B, the splitting (fission) of *Cosmarium*; C, the splitting of *Desmidium*, in which the new individuals remain attached.

symmetrical, and usually separate from one another. In some species they remain attached, and thus form long filaments.

In the sexual process two contiguous cells break open, and their contents unite into a single mass which soon surrounds itself with a thick wall, thus becoming a resting-spore (zygospore). In germination these spores separate their contents into two parts, each of which eventually becomes a new desmid.

In the classification of desmids three sub-families are recognized as follows: (1) Cells after division forming a filament (*Eudesmidieæ*), as in *Desmidium* (Fig. 1, C), *Hyalotheca*, *Gonatozygon*, etc. (2) Cells after division free, but connected by a hyaline branching filament (*Cosmocladieæ*), as in the single genus, *Cosmocladium*. (3) Cells after division always free, usually more or less bilobed (*Didymioideæ*), as in *Closterium* (Fig. 2, A), *Cosmarium* (Fig. 2, B), *Euastrum*, *Micrasterias* (Fig. 2, C), etc.

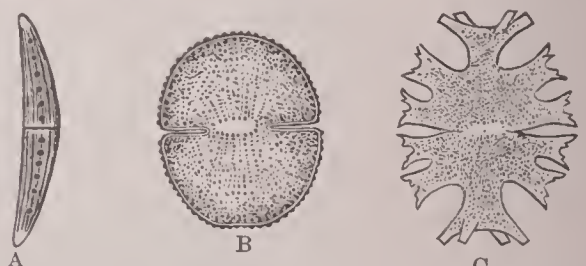


FIG. 2.—A, *Closterium striolatum*; B, *Cosmarium radiosum*; C, *Micrasterias americana*, all highly magnified.

LITERATURE.—*British Desmids*, by M. C. Cooke (1887), with 65 plates; *Desmids of the United States*, by Francis Wolle (1884), with 53 plates; *Sylloge Algarum* (vol. i., pp. 777 to 1236), by J. B. De Toni (1889), including descriptions of all known species. CHARLES E. BESSEY.

Des Moines, de-moin′: river of the U. S., the largest that traverses the State of Iowa; rises in the southwest part of Minnesota. It flows in a S. S. E. direction to the capital city, Des Moines, below which it runs nearly southeast-

ward until it enters the Mississippi river at the southeast extremity of Iowa, about 4 miles below Keokuk. Length estimated at 500 miles. It flows through fertile undulating prairies and a large field of bituminous coal.

Des Moines: city and center of seventeen railways; capital of Iowa and of Polk County (for location of county, see map of Iowa, ref. 5–G); on Des Moines river at the mouth of the Raccoon; 357 miles W. of Chicago, 174 miles W. of Davenport, and 138 miles E. of Omaha. The State capital was removed in 1857 to this city, which was at that time called Fort Des Moines, founded five years earlier. A new State-house has been erected at a cost of $3,000,000.

State capitol, Des Moines, Ia.

The State library contains over 50,000 volumes, and the city maintains a large free library. The State arsenal, a large building, contains, besides military equipments for the State, the tattered flags of all Iowa regiments engaged in the war of 1861–65, and other trophies and articles of interest. The city has 85 churches, 45 public school buildings, and several private schools; 3 high schools, 8 colleges, a museum, an extensive system of electric railways, water-works, 4 daily, 28 weekly, and 15 monthly and semi-monthly periodicals; 14 banks (4 national, 8 savings, 1 State, and 1 private), with an aggregate of nearly $2,000,000 capital and about $1,000,000 surplus; 50 insurance companies; a U. S. court-house and post-office, built of Joliet stone, costing $350,000, and a large county court-house. The city is surrounded with inexhaustible coal lands, and coal is mined so cheaply that the cost of motive-power is trifling.

A military post for cavalry and artillery has been established here, and $200,000 appropriated by Congress for land and buildings.

Manufactures.—The manufacturing interests are large and rapidly increasing, including starch-factories, cotton, woolen, flour, and oatmeal mills, packing-house, linseed-oil mills, and manufactories of paint, soap, boilers, plows, scales, wagons, carriages, brooms, shoes, bricks, boats, confectionery, crackers, excelsior, furniture, woven-wire fence, gloves and mittens, hats, harness, hosiery, iron and brass, proprietary medicines, novelties, pottery, pumps, printing-presses, pianos, suspenders, show-cases, tents, type-writing machines, trunks, windmills, white bronze, yeast, and washing-machines. The U. S. census report for 1890 shows 297 manufacturing establishments, with a capital of $2,792,979, giving employment to 3,149 persons, at an annual wage of $1,660,969. The cost of material used was $2,425,796, and the value of products $5,242,992.

Population.—Des Moines is the most populous city in Iowa. Pop. (1880) 22,408; (1890) 50,093; (1900) 62,139.

SECRETARY OF COMMERCIAL EXCHANGE.

Desmond: a noble family of Ireland, whose founder was MAURICE FITZGERALD, who became Earl of Desmond and one of the three chief governors of Dublin. GARRET, Earl of Desmond, the head of the Southern Fitzgeralds and an all-powerful chief in Munster, refused to submit to the authority of Queen Elizabeth, and was declared a traitor. He then submitted, but revolted in 1574, and again in 1579. Driven from his lands and hunted as an outlaw, he was discovered and slain by the English in 1583. From that time the family ceased to be powerful, and it is now extinct.

Desmoulins, dā′moo′lăn′, LUCIE SIMPLICE CAMILLE BENOIST: political journalist and revolutionist; b. at Guise, Aisne, France, Mar. 2, 1760; studied law in Paris, and embraced the ideas of the Revolution with boundless enthusiasm. Some of his writings had already attracted attention and exerted considerable influence, when he was suddenly lifted into prominence by his passionate address in the garden of the Palais Royal, July 13, 1789, which stirred up the people to the storming of the Bastile on the following day, and may perhaps be considered the beginning of the active manifestations of the Revolution. He became a devoted follower of Danton; edited the *Révolutions de France et de Brabant* with great brilliancy and audacity, reflecting and controlling the tumult and passion of the hour; was a prominent member of the Cordeliers Club, and one of the leaders of the rising of Aug. 10, 1792. In 1792 he became a member of the convention, in which he acted with the Mountain, voted for the death of the king, and aided in the overthrow of the Girondists. Still following Danton's leadership, he joined the latter in an effort to counteract the bloodthirsty excesses into which the *Enragés* plunged the Revolution, and in his paper *Le vieux Cordelier*, which had much fame and possessed admirable literary qualities, he denounced these excesses with courage and often nobility of spirit. Indeed, his wit contributed much to his ruin. He incurred the implacable hatred of Saint-Just by saying that the latter "carried his head like the Holy Sacrament." Robespierre, his schoolmate, who had several times intervened in his favor, and who in his speeches gave some very striking characteristics of his noble enthusiasm and dangerous talent, and of the peculiar tenderness and waywardness of his character, finally deserted him. He was involved in the proscription of Danton, and was executed with him Apr. 5, 1794. At the last his courage failed him, and he was conducted to the guillotine in a state of piteous terror which contrasted strangely with the courage of Danton. Lucile Duplessis, to whom he was married in 1791, and whom he tenderly loved, soon followed him to the guillotine. He was not a great leader like Danton, but rather a brilliant guerrilla. Of all the actors of the Revolution he was the most gifted writer. "No one," says Lamartine (*History of the Girondists*), "could so well personify the populace with its tumultuous movements, its nobility, its inconstancy, and its quick transitions from fury to pity for its victims. A man at once so ardent and so volatile, so trivial and so inspired, so undecided between blood and tears, must have influence over an insurgent people in proportion as his nature is congenial with theirs." See Thiers, *History of the French Revolution*; Carlyle, *French Revolution*; Lamartine, *History of the Girondists*; Claretie, *Œuvres de Camille Desmoulins* (Paris, 1874) and *Camille Desmoulins* (Paris, 1875); Robinet, *Le Procès des Dantonistes d'après les documents, etc.* (Paris, 1879); and the biography by Godart (1889).

C. H. THURBER.

De Soto: city; Jefferson co., Mo. (for location of county, see map of Missouri, ref. 5–J); situated on railway, 43 miles S. W. of St. Louis. It is an important center in a mining district. Pop. (1880) 1,989; (1890) 3,960; (1900) 5,611.

De So'to, HERNANDO: Spanish explorer. See SOTO.

De Spenser, HUGH LE: a favorite of King Edward II., whose rapid rise and arrogant manners provoked the hatred of the barons. Aided by the queen and led by Lancaster, the barons forced De Spenser into exile (1321), but the king's unexpected energy discomfited the malcontents. De Spenser was recalled; Lancaster was defeated and executed with many of his adherents. In 1326 the barons revolted, with the queen again on their side. The king's party was captured, and De Spenser promptly hanged. The king was dethroned and imprisoned (1327). F. M. COLBY.

Despoblado: See PUNA.

Dessalines, des′săă′leen′, JEAN JAQUES: Haitian revolutionist; b. at Grande Rivière, département du Nord, 1758. He was a Negro slave, and for a time belonged to another Negro, one Dessalines, from whom he took his name. Joining the insurrection of 1791, he allied himself to the atrocious bands of Brouckman and Jean François. Later he attracted the attention of Toussaint Louverture, who rapidly promoted him until he became a general of division and second in command. Dessalines was so ignorant that he could hardly write his own name, and he was quite incapable of planning a campaign or even a battle, but his ferocious courage was very effectual in the strife with the mulattoes,

who were generally led by men as ignorant as himself. At Artibonito he distinguished himself against the English, and subsequently he commanded different departments successfully, ruling by brute force and cruelty. When the French expedition of Leclerc arrived Dessalines opposed them bravely in the department of the West; at the fort of Crête à Pierrot he defended himself with only 1,000 men until nearly 2,000 of the assailants were killed or wounded (Mar. 25, 1802). He at length submitted; but after the departure of Toussaint he joined with others in a new revolt, and was recognized as general-in-chief by the blacks. The French army had been decimated by yellow fever; Dessalines, aided by the English, defeated them several times, and they finally evacuated the island (Nov., 1803). On Jan. 1, 1804, the independence of Haiti was declared, and Dessalines was named governor-general for life, with full legislative and military powers, and the right of appointing his successor. He expelled nearly every Frenchman from the eastern end of the island, and attempted, unsuccessfully, to subdue Santo Domingo. Imitating Napoleon, he had himself proclaimed emperor as Jean Jacques I. (June 16, 1805). But his tyranny soon provoked hatred, and he was waylaid and killed near Port au Prince, Oct. 17, 1806. HERBERT H. SMITH.

Dessau, des'sow: a town of Germany; capital of the duchy of Anhalt; on the Mulde near its entrance into the Elbe; 80 miles by railway S. W. of Berlin (see map of German Empire, ref. 4–F). It is well built, and contains a fine ducal palace, a town-hall, a theater, a college, and a normal school. Here are many paintings of the early German masters. It has manufactures of woolen cloth, hosiery, hats, tobacco, etc. It was at the bridge of Dessau that Wallenstein won his victory over Count Mansfeld in the Thirty Years' war, Apr. 25, 1626. Pop. (1895) 42,375.

De Staël-Holstein, ANNE: See STAËL-HOLSTEIN, etc.

Dester'ro, NOSSA SENHORA DO (often called Santa Catharina): capital and principal city of the state of Santa Catharina, Brazil; beautifully situated on the western side of the island of the same name, facing the strait which divides it from the mainland (see map of South America, ref. 1–F). This strait forms an excellent and secure anchorage, with only a slight exposure to south winds. The city is backed by high hills, and is itself built on very irregular ground; the streets are ungraded and almost impassable for carriages. Feather flowers and ornaments are manufactured and exported in considerable quantities. A Portuguese named Monteiro settled here in 1650, and built the chapel from which the place took its name. He was driven out by the Dutch, but the locality was resettled in later years. Pop. about 6,000. H. H. SMITH.

Desty, ROBERT: See the Appendix.

Detaille, de-tăl', JEAN BAPTISTE ÉDOUARD: military painter; b. in Paris, Oct. 5, 1848. Pupil of Meissonier; medals of honor, Salon, 1888, and Paris Exposition, 1889; officer Legion of Honor 1881. A draughtsman of great skill and delicacy, and one of the most popular painters of the day. He seldom paints action in war, but his pictures of soldier life are in every way excellent. His name is usually coupled with that of de Neuville, the two being counted the foremost military painters of the modern French school. Many of his pictures are in U. S. collections; among them *Skirmishing near Paris*, 1870 (Vanderbilt collection, New York); *French Cuirassiers bringing in Bavarian Prisoners* (Corcoran Gallery, Washington). W. A. C.

Determinants: certain symmetrical algebraic functions of n^2 quantities of very frequent recurrence in the theory of equations, and still more in the higher geometry. Thus, if we take the product $a_1b_2c_3...n_n$ of n factors, and permute the subscript indices in every possible way, we shall have 1.2.3....n products. If now we give to each one of these several products a *plus* sign whenever the number of interchanges of indices necessary to produce it from the above product is *even*, and a *minus* sign when the number of interchanges is *odd*, and add the results, we have the *determinant* of the n^2 quantities a_1, b_1, c_1, ...n_1, a_2, b_2, c_2, ...n_2, a_3, b_3, etc.

The determinant is usually written thus:

$$\begin{vmatrix} a_1\ b_1\ c_1 \dots n_1 \\ a_2\ b_2\ c_2 \dots n_2 \\ a_3\ b_3\ c_3 \dots n_3 \\ \dots\dots\dots\dots \\ a_n\ b_n\ c_n \dots n_n \end{vmatrix}$$

but it is also sometimes written $\Sigma\pm\ (a_1b_2c_3...n_n)$, where the product written in the parenthesis is that of the letters along the diagonal of the matrix, beginning at the upper left corner.

Determinants play a most important part in every branch of advanced mathematics. The most extended treatise on them is the German one by Baltzer.

Revised by S. NEWCOMB.

Determinate Problem: a problem in geometry which admits of a limited number of solutions, an indeterminate problem being one which admits of an indefinite number of solutions. Thus the problem, "Given the base, perimeter, and area to construct the triangle," is determinate, there being in general but four solutions. By omitting one of the three data, however, the problem becomes indeterminate. For instance, an infinite number of triangles having the same perimeter can be constructed on a given base. The problem, however, is not *perfectly* indeterminate, for the vertices of all such triangles are restricted to a certain locus —i. e. the ellipse whose foci are the extremities of the given base. In general, the omission of one of the conditions or data which render a problem determinate leads to a local problem.

Determinism: the doctrine that denies the freedom of the will, and refers all acts of seeming volition to a law of necessity. According to Sir William Hamilton's use of the term, it signifies the theory of the necessitarian school of philosophers, who hold that the acts of the will are determined by an inner necessity arising from the controlling force of motives acting upon character. These motives in man are the result of his peculiar and necessary development in accordance with the laws of the universe, of which he is a part. This doctrine is a part of pantheistic systems of philosophy, but belongs as well to other systems, and holds a prominent place in the philosophy of Leibnitz, according to which each monad, substance, or being acts independently of all others, but by a pre-established harmony governing its internal development is prevented from conflicting with the rest of the universe. The theory of determinism has been maintained by the exponents of various systems of philosophy, and approached from widely different standpoints. Schopenhauer, Julius Müller, J. S. Mill, and Buckle have advanced it in one form or another, and among theologians it has given rise to endless discussion. St. Augustine employed the argument of determinism against the Pelagians, and the early Calvinists zealously maintained this doctrine as the necessary consequence of the theory of predestination. See FATE, NECESSITY, and WILL.

Det'inue [O. Fr. *detinu*, past ptc. of *detenir*; Mod. Fr. *détenir*, detain < Lat. *detine're*; *de*, from + *tene're*, hold]: in the common law, an action for the recovery of a personal chattel wrongfully detained, or its value, with damages and costs. The action is for the recovery of a specified article; the chattel therefore must be of such a character that it can be distinguished from others, as a horse. The plaintiff must have an absolute or special property in the article at the time he brings the action. The defendant must have had possession at some time, which should have been acquired in some lawful manner, as by contract or finding. The nature of the possession must also continue. Thus, if a finder should sell the thing found before action, the proper remedy would be an action for conversion, though if he had not sold there might be a case of detinue. In the U. S. this form of action has been largely superseded by the less technical actions of trover or replevin. Revised by F. STURGES ALLEN.

Detmold, det'mōlt: a town of Germany; capital of the principality of Lippe-Detmold; on the Werre; 42 miles S. W. of Hanover (see map of German Empire, ref. 4–D). It has a fine castellated palace, a museum, a theater, a public library, and a celebrated teachers' seminary; also manufactures of linen and woolen goods, tobacco, cards, and carved work in wood and stone. Near this town is the battle-field where Hermann destroyed the Roman army of Varus in 9 A. D. Pop. (1890) 9,735.

Detmold, WILLIAM, M. D.: b. in Hanover, Germany, Dec. 27, 1808; studied medicine in Göttingen; served as surgeon in the Hanoverian army; in 1837 became a resident of New York city; professor in College of Physicians and Surgeons; introduced orthopædic surgery into the U. S.; during the civil war acted as volunteer surgeon in Virginia; invented a knife and fork for one-handed men, known as "Detmold's knife." D. in New York, Dec. 26, 1894.

De Tocqueville, de-tŏk'veel', ALEXIS CHARLES HENRI CLEREL: French publicist. See TOCQUEVILLE, DE.

Detouche, Laurent Didier: painter; b. at Rheims, France, July 29, 1815; was educated for the legal profession, but in 1837 entered the studio of P. Delaroche, and thenceforth devoted himself to art. Among his historical paintings are *Saint Paul ermite*, which he gave to the Cathedral of Rheims in 1840; *Le Supplice de Jeanne d'Arc* (1841), which procured him the gold medal; and *La Disgrâce de Fouquet* (1853). He also did excellent work as a painter of *genre*. D. at Paris, Apr. 28, 1882.

Detours, Hippolyte: lawyer and politician; b. at Moissac, France, Jan. 5, 1799; held office under the restored Bourbons. In 1837 he was admitted to the bar, and practiced law. He was elected to the Assembly after the February revolution, and voted with the extreme left. After the *coup d'état* of 1851 he resumed his practice at Moissac. D. at Limoux, July 2, 1885.

De Trobriand, de-trō'brĕĕ'ăn', Philip Regis: author and officer in U. S. army; b. June 4, 1816, in Tours, France; removed to U. S.; served with distinction on the Union side in the civil war; commanded defenses of New York, May, 1864; attained rank of brevet major-general of volunteers; served in the West after the war; retired Mar. 20, 1879. Author of *Les Gentilshommes de l'Ouest* (Paris, 1841); *Quatre ans de Campagnes à l'armée du Potomac* (1867); editor and publisher of the *Revue du nouveau monde* (New York, 1849–50); editor of the *Courrier des États-Unis* (New York, 1854–61). D. at Bayport, L. I., July 15, 1897.

Detroit' [Fr. *détroit*, the strait]: an important railway and commercial center; the metropolis of Michigan and capital of Wayne County (for location of county, see map of Michigan, ref. 8–K); on the west bank of the Detroit river; 18 miles from Lake Erie and 7 miles from Lake St. Clair; in lat. 42° 19′ 53″ N., lon. 82° 58′ W. The Detroit river, which is the boundary-line between the U. S. and Canada, is of varying width, being half a mile broad opposite the city, and of great depth, forming an excellent harbor.

The site upon which the city is built rises from the edge of the river, the inclination being gradual, at the rate of about 58 feet per mile, affording perfect drainage. Detroit is one of the best-sewered cities in the U. S. The streets are broad and well paved, and the number of handsome private residences and business buildings is large.

The city is abundantly supplied with water, there being 560 miles of pipe laid up to Jan. 1, 1900, at which time the aggregate cost of construction of the water-works amounted to $6,061,110. The water-works have a bonded debt of $1,033,000. The city has a perfectly disciplined paid fire department, with steam apparatus, etc., costing $1,700,000, and also a fire-alarm telegraph. The expense of the department in 1900 was $568,707. The city has a uniformed metropolitan police force, with a central, 7 precinct and 5 sub stations. The expenses of the force for 1900 were $554,850. There are 70 public school buildings, valued at $2,444,295, with 898 teachers and an enrollment of 34,000 pupils. The annual expenses of the schools are $1,085,710. There are, besides Detroit College, an art school, several convents, 30 Roman Catholic parochial schools, 23 German Lutheran schools, and a large number of private institutions, including 4 commercial colleges. The assessed valuation of the real and personal property of the city in 1900 was $244,371,550. The bonded debt of the city July 1, 1900, was $5,074,000—resources in sinking fund, $1,609,809.88; net debt, $3,724,637. The principal work of art adorning the city is the Michigan Soldiers' and Sailors' Monument, designed by Randolph Rogers, and built of bronze and granite at a cost of $75,000. The structure is 55 feet high, surmounted with a colossal bronze allegorical statue of "Michigan." The chief public buildings are the city-hall, situated on the Campus Martius and facing upon four streets, and the county court building opposite, on Cadillac Square. The latter is regarded as one of the finest in the West, and cost $2,250,000. The house of correction, which has attained a national and European reputation, is valued at upward of $400,000, and has a capacity for 600 prisoners. There are 187 miles of electrically equipped street railways in the city, and 297 miles of suburban electric railway tracks. The public library contains 162,511 volumes. There is a bar library with upward of 7,000 volumes. There are 3 medical colleges, 6 public hospitals, 4 orphan asylums, 2 foundling and women's hospitals, an insane asylum, 3 houses of shelter for magdalens, an industrial school, 2 homes for the aged poor, 2 old ladies' homes, and numbers of other benevolent institutions of less prominence. There are 200 churches. Some of these church edifices are noble specimens of architecture. The city contains 6 national banks, 16 State banks, 2 trust companies, and a number of building and loan associations and savings and loan institutions. It is the seat of the U. S. circuit court for the sixth circuit, and the U. S. district court for the eastern district of Michigan, the Wayne County circuit court, the recorder's and the probate court of Wayne County. The U. S. custom-house for the port of Detroit and the internal revenue office are located here, as are also the principal office of the U. S. lake survey and the department in charge of the lake lighthouses. Fort Wayne, designed to be the most extensive American fortification on the northern frontier, is located just below the city, commanding both it and the river. Though in an incomplete state, it includes a series of batteries protected by earthworks, and is garrisoned by a force of infantry. There are nine cemeteries. The three principal—Elmwood, Mt. Elliott, and Woodmere—are upon locations of great natural beauty, and are embellished by skillful landscape-gardening and tasteful monuments. There are twenty public parks, the largest of which, Belle Isle, contains about 700 acres. It was purchased in 1879 at an expense of $200,000, and over $1,250,000 has been expended in its improvement. A bridge connects it with the city proper. Palmer Park, which has an area of 133 acres and is situated in the northern part of the city, is next in size. A boulevard extends from the Belle Isle bridge nearly to the western boundary of the city, surrounding a large portion of it on three sides. The city is lighted by its own plant, established in 1893. The plant complete cost the city to July 1, 1899, less depreciation charges, the sum of $720,620.34, and it is electrically equipped for 2,375 2,000 candle-power arc lamps and 3,000 16 candle-power incandescent lamps. The cash cost for an arc light for the year ending July 1, 1900, was $40.30. The number of street lights operated is 2,002 arcs of 2,000 candle-power each, placed at 1,695 locations.

Manufactures.—There are many foundries, blast furnaces, copper-smelting works, locomotive and car works, ship-yards, dry-docks, iron-bridge works, safe-manufactures, furniture and other establishments using wood as the chief material, pork-packing establishments, and some of the most extensive tobacco and cigar, salt and soda-ash factories in America. The shipping trade of the city in produce and manufactures is very large. The U. S. census report for 1890 shows 1,744 manufacturing establishments, with a capital of $43,275,940, giving employment to 38,281 persons, at an annual wage of $18,911,712. The cost of materials used was $41,225,534, and the value of products $77,039,177. There are 8 daily papers, 2 being in the German language, 34 weeklies, 4 semi-monthlies, 23 monthlies, and 1 quarterly.

History, etc.—The present site of the city was first visited by the French in 1610, and remained under their dominion until 1762. The first legitimate settlement was made in 1701, at which time a fort was erected called Ponchartrain, the first governor being the Sieur de la Motte Cadillac; and from time to time emigrants were sent over by the French Government. In 1763 the British assumed possession, erecting fifteen years later a fort. In 1787 its government was assumed by the U. S., Gen. Arthur St. Clair being the first governor. In 1812 it was surrendered to the British, and was retaken in 1813. In 1824 it was incorporated as a city. The history of Detroit is intimately connected with the history of the whole Northwest. Three different sovereigns have claimed its allegiance, and since the U. S. have held it thrice has its government been transferred. It has twice been besieged by Indians, once captured in war, and once totally consumed by fire. 'Pop. (1870) 79,577; (1880) 116,340; (1890) 205,876; (1900) 285,704.

Editor of "Free Press."

Detroit City: capital of Becker co., Minn. (for location, see map of Minnesota, ref. 5–B); on Detroit Lake and on the Northern Pacific R. R., 206 miles W. of Duluth; is chiefly engaged in agriculture. Pop. (1890) 1,510; (1900) 2,060.

Detroit River: outlet of Lake St. Clair; flows nearly southward, forming part of the boundary between Michigan and Canada, and enters Lake Erie. It is about 24 miles long, and from half a mile to one mile wide, and is navigable for the largest vessels.

Detroyat: de-trwäă'yaa', Pierre Léonce; soldier and writer; b. at Bayonne, France, Sept. 7, 1829; entered the navy in 1845; served in the Crimean war and in the expeditions to China and to Mexico. Accompanying the Empress Charlotte back to Europe, he was by the French Govern-

ment forbidden to return to Mexico on account of the unfavorable report he made on Bazaine, after which he withdrew from the navy and devoted himself to journalism. In 1871 he was for some time commander of the camp at La Rochelle, but resumed, after the war, his journalistic work as editor of *Le Bons Sens*, and afterward of *L'Estafette*. He published *La Cour de Rome et l'empereur Maximilien* (1868); *L'Intervention française en Mexique* (1868); *Possessions françaises dans l'Indo-Chine* (1887), and other works.

Dettingen: Bavarian village; on the Main; noted for an important battle in the war of the Austrian Succession, in which the so-called Pragmatic army, consisting of the Austrians, Hanoverians, and English under George II. defeated a larger French force under Marshal Noailles, June 27, 1743. The French armies fell back into Alsace, and Charles VII. made peace with Maria Theresa. This was the last time an English king took the personal command of an army in battle. Pop. 657.—There is another DETTINGEN, 10 miles E. of Reutlingen, in Würtemberg. Pop. (1890) 3,322.

Deuca'lion (in Gr. Δευκαλίων): in the Greek mythology, a son of Prometheus and the husband of Pyrrha; also the father of Amphictyon and Hellen. According to tradition, he saved himself and his wife from a deluge by building a ship or ark, which, when the water subsided, rested on Mt. Parnassus. As soon as the waters had retired from the surface of the earth, Deucalion and his wife went to consult the oracle of Themis, and were directed to repair the loss of mankind by throwing behind them the bones of their grandmother. This expression meant only the stones of the earth; and, after some hesitation as to the meaning of this obscure oracle, they obeyed. The stones thrown by Deucalion immediately became men, and those thrown by Pyrrha women.

Deus ex machinâ, dee'ŭs-eks-măk'i-na [Lat. translation of Gr. ἀπὸ μηχανῆς θεός, the god appearing from the stage machinery]: a supernatural deliverer; an expression borrowed from the classic stage with reference to the practice of the Greek dramatic poets, in having recourse to the intervention of a god, who descended by stage machinery, and brought about a speedy *dénoûment* of the plot.

Deuteronomy [Gr. δευτερονόμιον (late), duplicate law; δεύτερος, second + νόμος, law]: the last book of the Pentateuch, consisting in part of a restatement of the law, as given in Exodus, Leviticus, and Numbers, and containing also, besides special commands and admonitions not previously given, an account of the death of Moses. The authorship of this book has been traditionally assigned to Moses, but of course the part relating to his death is not supposed to have been written by himself. Much critical labor has been bestowed upon the book, and its Mosaic authorship has been both assailed and defended with great learning and ability. See HEXATEUCH.

Deutsch, doitch, EMANUEL OSCAR MENAHEM: author; b. at Neisse, in Prussian Silesia, Oct. 28, 1829. He studied, in Berlin, Hebrew, especially the Talmud, Aramaic, Chaldee, etc.; visited the East twice, in 1869 and 1873; was in 1855 appointed assistant in the library of the British Museum, and contributed a number of valuable articles to various periodicals and encyclopædias. His brilliant article *The Talmud* in the *Quarterly Review* for Oct., 1867, was translated into several foreign languages. A volume of his *Literary Remains*, edited by Lady Strangford, with a brief sketch of his life, appeared in London and New York (1874). D. in Alexandria, Egypt, May 12, 1873.

Deutsch, SOLOMON: See the Appendix.

Deutz, doits (anc. *Tuitium*): a fortified town of Prussia; on the right bank of the Rhine, opposite COLOGNE (*q. v.*). It is the terminus of a railway extending to Minden (see map of German Empire, ref. 5-C). Pop. 17,773.

Dent'zia [named after *Deutz*, a botanist of Amsterdam]: a genus of shrubs belonging to the order *Saxifragaceæ*, and indigenous in Northern India, China, and Japan. *Deutzia scabra* has leaves very rough, with siliceous hairs, which are used in Japan for polishing wood. *Deutzia gracilis*, a hardy shrub with elegant white flowers, is much cultivated in gardens in the U. S.

Deux Ponts: See ZWEIBRÜCKEN.

Deux Sèvres: See SÈVRES DEUX.

Dev, dāv, or **Dew**: a Persian word, akin to the Sanskrit *devá*, god, but deriving its meaning of evil spirit from the use of the word *daeva* in the Zend Avesta. For the peculiar differentiation of meaning in the word-pair Sanskrit *asura*, *dêva* and Zend *ahuro*, *daeva*, see v. Bradke, *Dyâus Asura*. See ZOROASTER, RELIGION OF.

Dêva, dā'va: Sanskrit word from √*div*, shine, signifying god, and forming a part of many names in Hindu mythology, as Kāmadêva (the god of love), Mahādêva (the great god), a name of SIVA (*q. v.*).

Devaloka: literally, the sphere or abode of a deva or god. The Buddhist system recognizes six devalokas or celestial spheres, situated in tiers above MT. MERU (*q. v.*), and between the Brahmalokas and the Earth. The lowest is the heaven of the "Four Kings" who guard the Earth and the Heavens against the assaults of the Asuras or demons who live beneath the Earth. Each of these kings guards one-quarter of the heavens. The second devaloka is the heaven of Indra, and is called Trayastrinsha, or "the heaven of the thirty-three divinities." The third is that of the Yamas, beings who take no part in the war against the Asuras, and are hence called the "strifeless." The fourth devaloka is the heaven that is called Tushita. It is the home of the Bodhisatvas, or persons who are destined to become Buddhas. Maitreya, the coming Buddha, now lives there and presides over it. The fifth devaloka is that of the Nirmanarati, or devas who delight in transformations, or, according to another interpretation, who constantly enjoy pleasures provided by themselves. The sixth and highest, that of the Paranirmita vasavartin, beings who constantly enjoy pleasures provided by others, or who, while others are transformed, are themselves independent. In the first of these devalokas life lasts 500 years, but one day there is equal to fifty years on earth. In the second life lasts 1,000 years, and the day is equal to 100 earthly years. In the third life lasts 2,000 years, and the day equals 200 earthly years, and so on in geometrical progression up to the highest, where life lasts 16,000 years, and the day is equal to 1,600 years on earth. Above these six heavens are sixteen Brahmalokas rising one above the other. In these there are no sensual enjoyments as in the devalokas, and there is no pain, though bodily form exists. Above all these are four formless or spiritual Brahmalokas, in the highest of which life lasts 80,000 MAHAKALPAS (*q. v.*), during which the inhabitants are not fully conscious and yet not quite unconscious.

According to the PURĀNAS (*q. v.*) there are seven devalokas, the second of which is Indraloka or Swarga, and the seventh Brahmaloka or Satyaloka, "the world of infinite wisdom and truth."

R. LILLEY.

Devanagari: See SANSKRIT LANGUAGE.

Devapraya'ga: town of Northern Hindustan; in Gurwhal; lat. 30° 8′ N., lon. 78° 39′ E.; at the confluence of the Alakanonda and Bhagirathi, which unite to form the Ganges. As the origin of that sacred river, it is considered a holy place by the Hindus, and is visited by multitudes of pilgrims. A flight of steps is hewn out in the rock down to the very edge of the water, and two large basins have been formed for ablution.

Development: See EVOLUTION; also DARWINISM.

Development of the Embyro: See EMBRYOLOGY.

Dev'ens, CHARLES, Jr., LL. D.: jurist; b. in Charlestown, Mass., Apr. 4, 1820; graduated at Harvard in 1838, and admitted to the bar in 1841; practiced in Berkshire County, and in 1847 was sent to the State senate; from 1849 to 1853 U. S. marshal for Massachusetts and prominent on account of his anti-slavery attitude. On the outbreak of the civil war (1861) he entered the service as major of the third battalion of Rifles, Massachusetts Volunteers, and distinguished himself, from the early engagement at Ball's Bluff till the closing scenes at Appomattox Court-house, rising to the rank of brigadier-general (brevet major-general). He was appointed associate justice of the superior court of Massachusetts in 1867, which position he retained until Oct., 1873, when he was appointed associate justice of the Supreme Court of Massachusetts. Appointed Attorney-General by President Hayes Mar. 7, 1877; resumed his position as associate justice of Supreme Court of Massachusetts 1881. He delivered addresses at the centennial celebration of the battle of Bunker Hill; at the dedication of the soldiers' monuments in Boston and in Worcester; on the deaths of Gen. Meade and Gen. Grant; and, as presiding officer, at the two hundred and fiftieth anniversary of Harvard College. D. in Boston, Mass., Jan. 7, 1891.

Dev'enter (Lat. *Daventria*): city of Holland; in the province of Overyssel: on the river Yssel, about 60 miles E. by S. from Amsterdam (see map of Holland and Belgium, ref. 5–H); is surrounded by walls or ramparts, and has a good harbor. It contains a cathedral, five other churches, a large town-house, a court-house, and several hospitals; has iron-foundries and manufactures of carpets, hosiery, etc., and exports butter. Pop. (1896) 25,527.

De Vere: See VERE.

De Vere, CLEMENTINE: See the Appendix.

Devereux: See ESSEX, EARL OF.

Devereux, JOHN HENRY: b. in Boston, Mass., Apr. 5, 1832; educated at Portsmouth, N. H., as a civil engineer, and began to work at once upon the construction of railroads. From 1848 to 1861 he was engaged in the building of railroads in Ohio and Tennessee. He was called to Washington by the Government Mar. 31, 1862, and in April following was appointed superintendent of military railroads. In Mar., 1864, he resigned the charge of Virginia railroads, and became superintendent, and subsequently vice-president, of the Cleveland and Pittsburg R. R.; resigned the latter position in 1868, and became president of the Lake Shore R. R., and afterward became general manager of the consolidated Lake Shore and Michigan Southern R. R. Resigning in June, 1873, he was elected president of the Cleveland, Columbus, Cincinnati and Indianapolis R. R. Company (1873); of the Atlantic and Great Western Railway Company (1874); and of the Indianapolis and St. Louis (1880). In 1877, by his personal courage, he prevented 800 of his men from joining in the railway riots. D. in Cleveland, O., Mar. 17, 1886.

Dêvî (Sanskrit, goddess): See PARVATI.

Deviation of Projectiles: See GUNNERY and GYROSCOPE.

Deviation of the Compass: See SHIP'S MAGNETISM.

Deviation of the Plumb-line: a phenomenon especially observed near mountains, in which case the attraction of the mountain evidently draws the line out of the perpendicular. Maskelyne took advantage of this fact in his experiments to determine the density of the earth. (See EARTH.) The same phenomenon has been observed on plains, and is probably caused either by great caves under ground, or by large masses of matter near the surface greatly surpassing in density the average of the earth near the point of observation. Mr. E. D. Preston, of the U. S. Coast Survey, has observed some striking instances in the Sandwich islands. He found the total deflection at Kaupo to be 29·1″; at Kohala, 30″ to the S.; at Hilo, 15″ to the N. From his measurements he drew the following conclusions:

I. Deflections of the plumb-line are greater on island than on continental mountains, presumably on account of the lighter surrounding sea water.

II. Deflections appear to be greater in the vicinity of extinct volcanoes than near active ones. See *American Journal of Science*, vol. xxxvi., p. 305.

Revised by E. L. NICHOLS.

De Vigny, de-vēēn'yee', ALFRED VICTOR, Comte: French author; one of the most prominent representatives of the Romantic school; b. at the castle Loches, Mar. 27, 1799. In 1828 he published a collection of poems called *Poèmes antiques et modernes*. He also produced (1826) *Cinq-Mars, or a Conspiracy under Louis XIII.*, which was very favorably received; *Stella, or the Blue Devils*, a narrative; and the tragedy of *Chatterton* (1835). D. Sept. 18, 1863.

Devil [O. Eng. *deōfol*: O. Sax. *diubal*: O. H. Germ. *tiufal* (> Mod. Germ. *Teufel*): Goth. *diabōlus*, from Lat. *dia'bolus*, or its source Gr. διάβολος, accuser (Eccles.), devil]: the name among Christians of any evil spirit, but especially of the chief of evil spirits, nearly corresponding in the latter sense to the Hebrew Satan and the Mohammedan Iblis or Shytân. The Greek for devil appears to be derived from the character of Satan as presented in the book of Job—that of a fault-finder or slanderer. In the Middle Ages, and even later, the devil was supposed to possess in perfection every kind of skill and knowledge—a skill and knowledge resembling that of man, indeed, but immeasurably surpassing it in degree. The devil was believed to possess transcendent skill in all the magic arts, and when a man of genius had accomplished some wonderful feat which seemed clearly above the unassisted powers of the human mind, it was commonly supposed (especially if he was not pre-eminently religious) that he had been either assisted by the devil or that the latter had performed for him the entire work; in which case, of course, some promise (such as the final surrender of the soul of the assisted party) or reward had to be given as an equivalent for his services. This idea, once almost universal in Europe, furnished the basis of the legend respecting Dr. Faustus. In the miracle plays of the Middle Ages the devil is the comic character, yet the players and the audience lived in daily fear of him. The doctrine of a personal devil was one of Luther's firmest possessions, and in private and public he had much to say about his agency.

It would seem probable that the prevailing superstitions of the Middle Ages respecting the devil might have been considerably influenced by the notions entertained of the character of Loki, the god of evil in the Norse mythology. As Loki is said to have taken various forms—sometimes of a woman and sometimes of one of the lower animals—in order more successfully to deceive, so the devil was supposed to assume at one time the appearance of a most beautiful woman to mislead and ruin the souls of men, at another time to take the form of a hunted animal to draw the too eager pursuer into danger and death; but all his wiles were of course lost upon those who looked to Heaven for help, and called on the protecting saints. For the consideration of theological connections, see SATAN.

Devil-fish: a popular name for one of the cuttle-fishes, usually *Octopus vulgaris*. In the U. S. applied in the Southern States to a large ray or skate (*Manta birostris*), and on the Pacific coast to the California gray whale (*Rhachianectes glaucus*). F. A. LUCAS.

Deville: See SAINTE-CLAIRE DEVILLE.

Devil's Coach-horse (*Deypus oleus*): a beetle common in Great Britain and on the Continent of Europe; belonging to the family *Staphylinidæ*. See ROVE-BEETLES.

Devil's Darning-needle: See DRAGON-FLY.

Devil's Dust: See SHODDY.

Devil's Island: See the Appendix.

Devil-worshipers, or **Yezidees**: a religious sect living in Armenia, Kurdistan, and Asiatic Turkey. They number more than 200,000. Their faith is a curious mixture of degenerate Christianity, as derived from the Gnostics, and Mohammedanism. Their chief peculiarity is that they treat the devil with great respect, because they believe he will be restored to heaven, where they wish him to be their friend. They hold the Old Testament in great reverence, and pay much less regard to the New Testament and the Koran. They practice both infant baptism and circumcision. They have four orders of priesthood. (See Layard's *Nineveh*.) There are various other sects of devil-worshipers.

De Vinne, THEODORE LOW: printer; b. in Stamford, Conn., Dec. 25, 1828. He learned the printing trade in Newburg, N. Y., and in New York city; became a member of the firm of Francis Hart in 1859. Shortly after the civil war he took a prominent part in forming the New York Typothetæ, was its first secretary, and has since been prominent in its proceedings; was president of the United Typothetæ of America 1887–88. In 1873 his firm began to print the *St. Nicholas* magazine, and later the *Century Magazine*. Upon the latter he was successful, after much experimenting, in printing the illustrated forms on dry paper in lieu of wet, which had been the trade usage, and thus secured a far more brilliant effect with illustrations. He was also the first printer to use coated paper for magazine and fine illustrated book-work. He has written much on trade topics, his chief works being the *Printers' Price List* (1st ed. 1869; 2d ed. 1871) and *The Invention of Printing* (1 vol. 8vo, 1878).

Devi'zes: town of Wiltshire, England; 22 miles N. N. W. of Salisbury (see map of England, ref. 12–G); has manufactures of snuff and malt, and some trade in grain. Here are ruins of the famous castle built by the Bishop of Salisbury (1132), and destroyed by Cromwell (1645). Pop. (1891) 6,426.

Devon: a county of England. See DEVONSHIRE.

Devonian Period: the division of geologic time following the Silurian period and preceding the Carboniferous; so called from Devon, England. As in the case of the Silurian, the most abundant vestiges of its life are invertebrate, and trilobites are among the dominant forms, but fishes, of whose earlier presence but scanty trace has been discovered, were then greatly developed as to variety and size. The earliest traces of trees belong to this period. In the U. S. Devonian

rocks are greatly developed in New York and Pennsylvania, where they have been classed under the terms Oriskany (oldest), Corniferous, Hamilton, Chemung, and Catskill. From this district, which may be regarded as the typical American area, a long and diminishing belt extends S. W. to Alabama, the formations appearing in various ridges of the Appalachian mountain system. In Maine the rocks have been recognized in a metamorphic condition. In the lower peninsula of Michigan they surround the coal basin. In Ohio, Indiana, and Kentucky they surround the Silurian area of the Cincinnati uplift, and they are also developed in Eastern Iowa. Farther westward their occurrence is sporadic, and they are usually of little thickness, but in Nevada they are well developed. In New York and Ohio they include limestones and sandstones, which afford large quantities of excellent building material. Among the upper members are great carbonaceous shales, which yield by natural distillation much of the petroleum and natural gas stored in the sandstones of Pennsylvania and Eastern Ohio, and some of these sandstones also belong to the Devonian series. One of the British formations of the period is a fresh-water deposit called the Old Red sandstone, and was the theme of a classic work by Hugh Miller, entitled *The Old Red Sandstone, or New Walks in an Old Field*. For descriptions of the American rocks and their life, see the official reports on the geology and palæontology of New York and Ohio, and an essay by H. S. Williams on *The Devonian and Carboniferous*, constituting Bulletin No. 80 of the U. S. Geological Survey. See also Fossil Fishes and Building-stone. G. K. G.

Dev'onport (before 1824 called Plymouth Dock): a maritime and fortified town of Devonshire, England; on the east shore of the estuary of the Tamar (called the Hamoaze); 2 miles W. N. W. of Plymouth (see map of England, ref. 15-D). It occupies high ground, and is separated from its suburbs, Stoke and Morice Town, by the glacis of its now dismantled fortifications. It derives its importance from the dockyard and naval arsenal, which is perhaps the largest in Great Britain. The national works occupy about 350 acres, and the dockyard comprises six building-slips for vessels of various rates. Here are also five docks, and manufactures of sails, ropes, anchors, soap, etc. Devonport has a residence for the port-admiral, a military hospital, large barracks, and extensive commercial wharves. It returns two members to Parliament. Pop. (1901) 69,674.

Devonshire (Lat. *Devonia*): a county of England; bounded N. by the Bristol Channel and S. by the English Channel. Area, 2,586 sq. miles. The surface is mostly hilly, and in some parts rocky. The highest point, High Willhayse, on Dartmoor, has an altitude of 2,039 feet. Granite, magnesian limestone, Devonian and Silurian rocks occur here; also copper and tin. It is drained by the rivers Exe, Dart, Tamar, and Torridge, the estuaries of which form good harbors. The climate of the south coast is mild; the soil is generally fertile. This county produces good apples, and is famous for its cider. The Red Devon breed of cattle is highly esteemed. The fisheries are extensive, and the manufactures are very important. Pop. (1901) 436,913.

Devonshire, Dukes (1694): Earls Devonshire (1618), Barons Cavendish (1605).—William Cavendish, K. G., P. C., D. C. L., F. R. S.; seventh duke, lord-lieutenant, and custos rotulorum of the county of Derby, high steward of Cambridge, chancellor of the University of Cambridge, etc.; b. Apr. 27, 1808; succeeded his cousin, William George Spencer Cavendish, in 1858; d. Dec. 21, 1891; succeeded by his eldest son, Spencer-Compton Cavendish, Marquis of Hartington. See Hartington, Marquis of.

Dew [O. Eng. *dēaw*: O. Sax. *dau*: Germ. *Thau*, connected with the Skr. root *dhav-*, flow]: moisture deposited during the night on the surfaces of bodies exposed in the open air. Dew is produced by the condensation of watery vapor from the atmosphere. Its deposition is, however, unaccompanied by the appearance of any visible mist. Such mist appears when the condensation takes place within the body of the air itself, and is then called "fog" in the lower regions of the atmosphere, and "cloud" in the higher. Dew occurs only at the surface of contact with solids, the air above remaining clear. The deposit of dew is caused by the cooling of the bodies bedewed, and this takes place in consequence of the radiation of heat into open space without any equivalent return. Experiments on vaporization have shown that when a liquid is exposed in a confined space to a constant temperature, vapor will be formed from it until the density reaches a certain determinate limit, invariable for the temperature, but greater as the temperature is higher, after which evaporation will cease. This maximum density is called the density of saturation or the density due to the temperature. Air is said to be saturated with vapor when the density of the vapor in it is the density due to its temperature. Should the temperature of a body of air in this condition be in the slightest degree depressed, the air will be supersaturated, and some of the vapor will be condensed, forming a visible cloud. But if, the temperature remaining the same, a body colder than the air be immersed in it, condensation will occur on the surface of that body only, and the air itself will remain clear. If, as is usual in the atmosphere, the air contain vapor without being saturated, it may be brought by cooling to a temperature at which it will be saturated, and then any further cooling will produce precipitation, as in the case before supposed. Or if the temperature of air in this condition remain unchanged, a body colder than the air immersed in it may produce condensation, provided its temperature be as low as the point of saturation, or lower, but not otherwise. This point is called the Dew-point (*q. v.*).

During the day the loss of heat by bodies on the earth, in consequence of radiation, is more than compensated by the amount received directly or indirectly from the sun. After sunset all such bodies begin to cool, but they cool with unequal rapidity, because of their different relations to heat. The atmosphere cools very slowly. Badly conducting solids cool rapidly. Good conductors, if in contact with the earth, cool less rapidly, because the heat they lose by radiation is, to an extent proportioned to their conducting power, restored by conduction from the earth beneath. If of small mass, however, and insulated by bad conductors, their temperature falls more rapidly. So soon as the cooling process has depressed the temperature of any object down to the point of saturation for the vapor present in the air, dew will begin to form upon it. Some bodies are bedewed very soon, others more tardily, and some occasionally escape altogether. Grass, which radiates well and conducts ill, is in the first class; wool and woolen stuffs, cotton, linen, silk, wood, earth, gravel, stone, and metals contract dew with less and less facility, nearly in this order. Polished metallic surfaces often remain untarnished by moisture throughout the night. In clear nights the difference of temperature shown by two thermometers, one lying on the grass and the other suspended in the open air, a few feet above, is often 8° or 10° F., and is sometimes much greater. In one instance, Mr. Glaisher (*Phil. Trans.*, 1847) observed a difference as great as 28½° F., the lower thermometer lying on raw wool.

Clouds check the formation of dew by obstructing radiation, or restoring by counter-radiation some of the heat lost. When the sky is wholly overcast no dew is formed. Neither is any dew formed beneath an open shed or shelter, though the earth around may be so distinctly wet as to leave the form of the roof distinctly marked on the ground. Facts of this kind were long supposed to prove that the dew descends like rain—a belief of which the trace is still preserved in the expression "the falling of the dew." Even a very slight screen, as a sheet of paper or a cambric handkerchief, spread out above an object exposed in the open air, will protect it perfectly against moisture from dew. Wind also prevents the formation of dew, by continually changing the strata of air in contact with the colder solids. The nights most favorable to the deposit of dew are those in which the sky is clear and the air motionless. The profuseness of the deposit will depend, however, upon the hygrometric state of the atmosphere.

Very various and very absurd notions prevailed among the ancients in regard to the dew. By some it was supposed to descend from the stars, and to be possessed of wonderful virtues. The Roman ladies were accustomed to use it as a cosmetic, supposing it superior to all other applications for the improvement of the complexion. The true theory of dew was first clearly set forth by William Charles Wells, a physician of London, in his famous *Essay on Dew*, first published in 1814. This standard authority has been many times reprinted. Revised by M. W. Harrington.

Dewar, James: See the Appendix.

Dewart, Edward Hartley, D. D.: minister; b. in County Cavan, Ireland, Mar. 30, 1828; received his school education at Toronto, Canada; entered the ministry of the Methodist Episcopal Church 1851; became editor of the *Christian Guardian* (published at Toronto, the oldest and chief of

the periodicals of the Canadian Methodist Church) 1869; author of *The Development of Doctrine* (1879); *Jesus the Messiah in Prophecy and Fulfillment*.

Dewberry: a kind of trailing blackberry. Two species are cultivated in the U. S.—*Rubus canadensis* of the Northern States, and *R. trivialis* of the South. The former is the more important. A variety of *Rubus canadensis*, called the Lucretia, is the best known and probably most valuable of the dewberries. This came into cultivation from West Virginia about 1875. Other varieties of this species are Bartel and Windom. The Pacific coast dewberry (*R. vitifolius*) has also been introduced to cultivation.

Dewdney, Edgar: Canadian cabinet minister: b. in Devonshire, England, in 1835, and educated as a civil engineer. He moved to British Columbia in 1859; was a member of the Legislative Assembly of that province 1868–69; of the Dominion Parliament 1872–79; and in the latter year was appointed Indian commissioner. He was Lieutenant-Governor of Northwest Territory from Dec. 3, 1881, to July 3, 1888, and on Aug. 3 of the latter year became Minister of the Interior. In Oct., 1892, he was appointed Lieutenant-Governor of British Columbia.

D'Ewes, Sir Symonds: antiquary; b. in Dorsetshire, England; educated at St. John's College, Cambridge, and called to the bar in 1623, but gave up his practice for the study of numismatics and historical manuscripts. He entered Parliament for Sudbury in 1640, and supported the popular party against the king, but being too moderate in his views to suit the radical element he was one of those driven from the House by Pride's Purge (1648). D. at Stow Langtoft Hall, Apr. 18, 1650. Materials for a history of England, collected but never published by him, have been of great service to subsequent historians. His *Journals of all the Parliaments during the Reign of Queen Elizabeth* were published in 1682. The *Autobiography and Correspondence*, edited by J. I. Halliwell (London, 1845), presents some interesting details of the manners of the time.

De Wet, Christian: soldier; b. in Dewetsdorp, Orange Free State (now Orange River Colony) about 1860. Was a successful farmer and a member of the Volksraad. Though he had had no previous military training, he fought with distinction in the British-Boer war of 1899–1900, attaining the rank of general in the Boer army. After the fall of Pretoria, with a small force, he, for many months, evaded capture and inflicted heavy losses on the British garrisons and patrols.

De Wet'te, Wilhelm Martin Leberecht: German biblical critic; b. at Ulla, near Weimar, Jan. 12, 1780. He studied at Weimar, under Herder, and at Jena, where Paulus was his teacher. In 1807 he was appointed Professor of Theology at Heidelberg, and in 1810 he was called to the newly founded University of Berlin. In 1819 he was dismissed from his chair and banished from the Prussian territories because he had written a letter of consolation to the mother of the Sand who murdered Kotzebue. He removed to Weimar, and was in 1822 called to Basel, where he remained till his death. His contributions to Old Testament criticism (especially in determining the date of Deuteronomy) and to biblical theology (in recognizing the literary independence of each biblical writer) were of great importance in his day. His writings are characterized by freshness and vigor and by an attractive combination of freeness and reverence. Among his works are a *Commentary on the Psalms* (1811); *Jewish Archæology* (1814); *Christian Dogmatics* (1813–16); *Introduction to the Old and New Testaments* (1817–26); *Lectures on Ethics* (1824); together with an exegetical manual to the Old Testament and a translation of the Bible (in conjunction with Augusti). He also wrote two romances, *Theodor* and *Heinrich Melchthal*. D. at Basel, June 16, 1849. See accounts by Schenkel (1849), Hagenbach (1849), Lücke (1850), and Stähelin (1880). C. H. Toy.

Dewey, Chester, D. D., LL. D.: botanist and teacher; b. in Sheffield, Mass., Oct. 25, 1783; graduated at Williams College 1806; became Professor of Mathematics and Natural Philosophy at Williams College, 1810; principal of the Collegiate Institute at Rochester, N. Y., in 1836; and from 1850 till 1860 Professor of Chemistry in the University of Rochester. He wrote many excellent monographs on the Carices of North America, etc. D. Dec. 15, 1867.

Dewey, George, LL. D.: U. S. naval officer; b. at Montpelier, Vt., Dec. 26, 1837; graduated at the Naval Academy in 1858; served with distinction on board the steamer Mississippi at the passage of Forts Jackson and St. Philip and the capture of New Orleans, Apr. 24, 1862, again on the Mississippi when she was lost at Port Hudson, Mar. 14, 1863, and on the Colorado at Fort Fisher, 1864–65. On Aug. 1, 1889, he was appointed chief of bureau of equipment with rank of commodore. He took command of the Pacific squadron on Jan. 1, 1898, and on May 1 destroyed the Spanish fleet in Manila Bay, the Philippines, without himself losing a ship or a man. He also captured Cavite, and later, in conjunction with Gen. Merritt, took Manila itself (Aug. 13). He was made rear-admiral 1898, and admiral 1899.

Dewey, John: See the Appendix.

Dewey, Melvil, M. A.: b. in Jefferson co., N. Y., Dec. 10, 1851; graduated at Amherst College in 1874; acting librarian there 1873–76; removed to Boston, where he founded (1) the American Library Association, of which he was secretary fifteen years, and then president; (2) the *Library Journal*, the monthly official organ of library interests, of which he edited the first five volumes; (3) the metric bureau for introducing decimal weights and measures; (4) Spelling Reform Association for simplifying English orthography—has been from the first secretary of the last two societies. In May, 1883, he became chief librarian of Columbia College; in May, 1884, was made Professor of Library Economy and director of the Columbia College School of Library Economy, proposed by him to be opened in Jan., 1887; in 1889 elected secretary and treasurer of the University of the State of New York, and director of the New York State Library, retaining also the directorship of the library school, which was transferred to the State Library. Perhaps his most important and far-reaching contribution to education is the careful revision and amplification of the laws of New York pertaining to higher education, including libraries, made in 1892 and known as the University Law. The *Decimal Classification and Relative Index*, the peculiar system devised by him in 1873 for increasing the efficiency and reducing the expenses of library administration, first published in 1876, has passed through numerous editions, as has *Rules for Authors and Classed Catalogs*, now published with his rules for other library departments as *Library School Rules*. He has edited, besides the *Library Journal*, *Library Notes*, *Metric Bulletin* and *Metric Advocate*, and is co-editor of *Spelling*, a continuation of the *Spelling-Reform Bulletin*.

Dewey, Orville, D. D., LL. D.: Unitarian minister; b. in Sheffield, Mass., Mar. 28, 1794. Originally a Calvinist, he graduated at Williams College in 1814, and at Andover Theological Seminary in 1819; he then became a Unitarian and preached in the pulpit of Dr. Channing in Boston, as his assistant, for nearly two years. He was pastor at New Bedford 1823–33, and in the city of New York 1835–48. In 1858 he became minister of the New South church in Boston, but retired in 1862 to his farm in Sheffield and devoted himself to religious studies with occasional preaching. He was an original thinker and an impressive pulpit orator. He published several volumes of sermons, a volume of European travels, and, as his chief work, *The Problem of Human Destiny* (n. c. 1864). A complete edition of his works, with a memoir by Miss Mary E. Dewey, his daughter, appeared in 1885 (Boston). Channing's favorite theme was the dignity of human nature and Dewey's the dignity of human life, and in his own person he gave it ample illustration. D. in Sheffield, Mass., Mar. 21, 1882.

Revised by J. W. Chadwick.

Dewing, Thomas Wilmer: figure and portrait painter; b. in Boston, May 4, 1851. Pupil of Boulanger and Lefebvre, Paris; National Academician 1888; member Society of American Artists 1880; Clarke prize, National Academy, New York, 1887; second-class medal, Paris Exposition, 1889. His pictures are refined and delicate in color, and his portraits, notably those of women, are marked by elegance of style and arrangement. He has painted some important decorations, including a ceiling, a composition of three female figures, in the Hotel Imperial, New York. *The Prelude* (1883), one of the best of his works, is in the collection of C. T. Barney, New York; other compositions are *The Days* (1887) and *The Garden* (1884). Studio in New York.

William A. Coffin.

De Winter, Jan Willem: b. at the Texel in 1750; entered the Dutch navy in 1762, but fled to France in 1787, having taken part in the attempts of the revolutionists; served afterward under Dumouriez and Pichegru with the French in the campaigns of 1792 and 1793, rising to the rank of a general of brigade; returned to Holland 1795,

and was by Napoleon placed at the head of the Dutch fleet. In the battle of the Texel he was defeated and captured by the English under Admiral Duncan, but an investigation of his conduct amply vindicated his gallantry and military skill. He became minister-plenipotentiary to France from 1798 to 1802, when he was again placed in command of the Dutch fleet, and he was highly trusted and honored both by Napoleon and the King of Holland. D. in Paris, June 2, 1812.

De Witt: town (founded in 1841); Clinton co., Ia. (for location, see map of Iowa, ref. 5–K); on Chi. and N. W. and Chi., Milwaukee and St. P. R. Rs.; 25 miles N. of Davenport and 20 miles W. of Clinton. The town has six churches, a public park, some manufactories, and a system of waterworks. Its principal industry is agriculture. Pop. (1880) 1,608; (1890) 1,359; (1900) 1,383. Editor of "Observer."

De Witt, Cornelius: Dutch naval officer and statesman; b. at Dort, June 23, 1623; had a high command under De Ruyter in 1666, when he burned the English shipping in the Thames; distinguished himself in the naval battle of Solebay in 1672. In the same year he was falsely accused of complicity in a plot to poison the Prince of Orange. He was imprisoned, tried, and acquitted, but as he was coming out of prison was murdered, by a mob, with his brother John De Witt (*q. v.*), Aug. 20, 1672.

De Witt, John: Dutch statesman; b. at Dort, Sept. 25, 1625. He was a leader of the party which was hostile to the House of Orange, or wished to reduce the power of the Prince of Orange. William II. died in 1650, and De Witt was elected grand pensionary of Holland in 1653, in which position he controlled the policy of the state in the interest of the republicans. In 1654 he negotiated with Cromwell a treaty of peace, in which a secret article stipulated that no member of the Orange family should ever be stadtholder. He was re-elected grand pensionary for a term of five years in 1658, and again in 1663. In 1665 Charles II. of England declared war against the Dutch, whose fleet entered the Thames and burned some shipping at Chatham. De Witt conducted the war with ability, and it was terminated by the peace of Breda, 1667. In the same year a perpetual edict was issued forever abolishing the office of stadtholder, and the policy of the grand pensionary seemed absolutely triumphant. Meanwhile Louis XIV. had invaded the Spanish Netherlands, and De Witt, thoroughly realizing the danger to Holland which would arise from the annexation by France of those provinces, formed the triple alliance between England, Sweden, and Holland, and compelled Louis XIV., at the Peace of Aix-la-Chapelle, to give up his plans. The French king, however, stung to the quick by this humiliation, succeeded, by his crafty diplomacy, in estranging England from Holland and in exciting a number of the minor German princes against the republic. In the meantime a change took place in the position of the grand pensionary. His popularity began to wane. The clergy, his natural enemies, openly attacked him. Finally the king invaded the republic with a great army. De Witt, being unable to repel the enemy, who captured several towns, was blamed for these misfortunes, and naturally became the object of public fury, which was further aroused through the efforts of the Orange party. William of Orange was chosen general-in-chief and stadtholder. De Witt went to prison to visit his brother Cornelius, who had been tried and acquitted. They were both murdered by the populace at the prison Aug. 20, 1672. See Motley, *United Netherlands* (4 vols., 1880); P. Simon, *J. de Witt en Zijn Tijd* (3 vols., 1832–35).

De Witt, John, D. D., LL. D., L. H. D.: biblical scholar of the Reformed (Dutch) Church; b. in Albany, New York, Nov. 29, 1829; graduated at Rutgers College in 1838, and at the Theological Seminary, New Brunswick, in 1842. Between 1842 and 1863 he was pastor of several churches, and then became Professor of Oriental Literature in the New Brunswick Seminary. From 1884 till he retired in 1892 his department was Hellenistic Greek and New Testament Exegesis. He published *The Sure Foundation, and How to Build on it* (New York, 1848; 2d ed. 1860); *The Psalms, a new Translation* (1891), the latter practically displacing his earlier work on the Psalms (1884 and 1885).

Willis J. Beecher.

De Witt, John, D. D., LL. D.: Presbyterian divine; b. in Harrisburg, Pa., Oct. 10, 1842; a graduate of Princeton College (1861); studied theology at Princeton (1864) and Union Theological Seminaries (1864–66). He was pastor of the Presbyterian church of Irvington-on-Hudson 1865–69, of the Central Congregational church, Boston, 1869–76, and of the Tenth Presbyterian church, Philadelphia, 1876–82; Professor of Church History, Lane Theological Seminary, 1882–88, of Apologetics and Missions in McCormick Theological Seminary, Chicago, 1888–92, and since of Church History in the Theological Seminary, Princeton, N. J. He has published about thirty review articles, many other papers and discourses, and *Sermons on the Christian Life* (New York, 1885).

Willis J. Beecher.

Dewlet-Gherai III.: the last khan of the Crimea; succeeded his uncle, Kerim-Gherai, as chief of the Crimean Tartars in 1769. He had more taste for court etiquette and ceremonies than for war, and, though supported by the Turks, he was expelled by the generals of Catharine II. D. in Constantinople about 1780. Three years later the Crimea was incorporated with Russia.

Dew-point: the temperature at which watery vapor in the air begins to be condensed. Its determination is of great importance to the meteorologist, as by comparing it with the actual temperature he can tell the relative humidity of the air. He knows that at the actual temperature the air would be saturated if it contained a certain quantity of moisture; and also that the actual quantity present is only such as would suffice to saturate air at the observed dew-point; the ratio of this last quantity to the former expresses the relation between the actual humidity of the air and the humidity of saturation at the observed temperature. The dew-point in the evening further shows the temperature near which the minimum during the night is likely to be. When the temperature has fallen to the dew-point, the vapor in the air will be condensed, and an amount of heat will be set free which will raise the temperature of the air. The temperature will again sink by radiation somewhat below the dew-point; dew will be formed, and the temperature again be raised. See Dew and Rain.

Revised by M. W. Harrington.

Dewsbury: town of the West Riding of Yorkshire, England; on the river Calder; 8 miles S. S. W. of Leeds (see map of England, ref. 7–H). It is on the Lancashire and Yorkshire Railway, and is connected with London by another railway. It has a grammar school, a chamber of commerce, an infirmary, and a handsome town-hall. It has manufactures of blankets, carpets, and coarse woolen goods made from shoddy (i. e. refuse rags worked over). There are collieries and iron-works in the vicinity. Pop. (1891) 29,847.

Dexip'pus (in Gr. Δέξιππος): Greek philosopher; pupil of Iamblichus; lived about A. D. 355. He wrote commentaries on Plato and Aristotle, and sought to defend the latter against the attacks of Plotinus. There is extant a treatise of his on the *Categories* of Aristotle, but only in a Latin translation, which was printed at Paris (8vo, 1549).

Dexippus, Publius Herennius: Athenian author, rhetorician, and soldier of the third century. He was a man of great learning, and attained the highest honors in his native state. He was also appointed commander of the army against the Goths (Scythians), who had invaded Attica, and defeated them, though not before they had captured Athens. A public statue was erected to his honor, the base of which, with its inscription, still exists. The fragments of the historical works of Dexippus are to be found in Müller, *Fragm. Hist. Græc.* (vol. iii., pp. 666–687).

Dexter: town, on railway; Penobscot co., Me. (for location of county, see map of Maine, ref. 6–E); has 7 churches, 5 woolen-mills, and 2 machine-shops, and is a center of trade for the surrounding country. The increase in population since 1890 is due to the opening of a new woolen-mill. Pop. of township (1890) 2,732; (1900) 2,941.

Dexter, Henry: See the Appendix.

Dexter, Henry Martyn, D. D., LL. D.: minister; b. at Plympton, Mass., Aug. 13, 1821; graduated at Yale in 1840 and at Andover in 1844; pastor in Manchester, N. H. 1844–49; and of the present Berkeley Street Congregational church, Boston 1849–67. From 1859 to 1866 he was one of the editors of the *Congregational Quarterly*, and in 1867 became editor-in-chief of the *Congregationalist*. Dr. Dexter was a voluminous writer, principally on subjects connected with the history and polity of Congregationalism, and with New England history generally. In this field he was a diligent explorer and an authority. One of his most important

works is *The Congregationalism of the Last Three Hundred Years*, etc. (New York, 1880). He left in manuscript an unfinished work on which he had been long engaged, on the *English and Dutch Life of the Plymouth Pilgrims*. He had much influence in the ecclesiastical affairs of the Congregational body. D. in New Bedford, Mass., Nov. 13, 1890. Revised by GEORGE P. FISHER.

Dexter, SAMUEL, LL. D.: jurist and statesman; b. in Boston, Mass., May 14, 1761; graduated at Harvard; studied law in Worcester, Mass., with Levi Lincoln; admitted to the bar in 1784; attached himself to the Federal party, and was elected a Senator of the U. S. in 1798. He was appointed Secretary of War in 1800 by John Adams, and became Secretary of the Treasury early in 1801. When the executive power was transferred to Jefferson in 1801, Dexter retired from the public service and resumed the practice of law in Boston. He had no superior and few equals as an advocate before the Supreme Court in Washington. As a supporter of the war against England, he separated from the Federalist party in 1812. He published *Letter on Freemasonry*, *Progress of Science*, and *Speeches and Political Papers*. D. in Athens, N. Y., May 4, 1816.

Dextrin [from Lat. *dexter*, right hand]: a substance ($C_6H_{10}O_5$) formed by the action of diastase on starch, and by the action of mineral acids on starch. There are several commercial products known as dextrin, British gum, starch gum, which are mixtures containing perhaps some dextrin. These products are used as substitutes for gum-arabic and other gums, in stiffening, sizing, and glazing calicoes, nets, crapes, laces, silks, papers, cards, etc., as mucilage on every office-table, and for the adhesive layer on the back of postage-stamps and on self-sealing envelopes. Some varieties of ink are thickened with them. Pure dextrin is a colorless, glassy body, which may be rubbed down to a white powder. It is practically tasteless, and inodorous. It is converted into maltose and then into dextrose by treatment with mineral acids. Revised by IRA REMSEN.

Dextrogy'rate [from Lat. *dexter*, right hand + *gyra're*, turn]: a term applied in optics to crystals which have the power to rotate a plane of polarization of a plane polarized ray toward the right. It is opposed to *lævogyrate*, which expresses the power to rotate the plane in like manner toward the left.

Dextrose: See SUGAR.

Dey, dā [viâ Fr. from Turk, *day*, maternal uncle, a title of respect]: a Turkish title of dignity given throughout the seventeenth century to the chief officer of the armies of Algiers, and signifying originally elder, since command depended upon seniority; but early in the eighteenth century the dignity of pasha was added to the dey, who thus became the chief civil as well as military officer in Algiers. His authority ended with the French conquest in 1830, but the title of dey is still given to the chief ruler of Tripoli. Tunis was governed by a dey at one period, but this title in the latter country has long been supplanted by that of bey.

Dezful, dez-fool', or **Dezfil**, -feel': town of Persia; province of Khuzistan; on Dezful river, here crossed by a bridge of twenty-two arches; 28 miles W. N. W. of Shuster (see map of Persia and Arabia, ref. 3–F). It is the chief mart of Khuzistan. Ancient ruins and mounds, evidently of Sassanian origin, are found in the vicinity. Pop. about 30,000.

Dhanis, Baron FRANÇOIS: See the Appendix.

Dhar, daar: town of Central Hindustan, in Malwa; the capital of a protected state of the same name, 32 miles W. S. W. of Indore (see map of N. India, ref. 8–D). It has two large mosques of red stone, and a fort with twenty-six towers. Pop. about 15,000.

Dhawalaghiri, da-wăl-a-gee'rē: lofty peak of the Himalaya Mountains, in Nepaul, Northern Hindustan; lat. 28° 42′ N., lon. 82° 32′ E. Its altitude is 26,826 feet, and it was formerly supposed to be the highest mountain of the earth.

Dhegiha Indians: See SIOUAN INDIANS.

Dhole, dōl: a species of wild dog, *Canis, or Cuon, dukkunensis*, found in the Western Ghauts and other mountainous parts of India. It is of a rich bay color, with a sharp muzzle, and large, pointed ears; is somewhat smaller than a wolf, and is remarkable for fierceness and courage, and for hostility to animals of the feline race.

Dhōl'ka: town of British India; presidency of Bombay; 22 miles S. W. of Ahmadâbâd (see map of S. India, ref. 1–C). It is inclosed by a mud wall, and stands in the midst of ruined palaces, mosques, mausoleums, and spacious tanks lined with masonry. Pop. 17,716.

Dholpur, dōl-poor': town of Rajputana, British India; on the Chambal, 34 miles S. of Agra (see map of N. India, ref. 6–E); is the capital of a feudatory state, with an area of 1,156 sq. miles and a population of 279,890. A fair lasting two weeks is held here annually. Pop. 16,000.

Dhun'chee, or **Dhanchi**: plant of the genus *Sesbania* and family *Leguminosæ*, having an extended loment with many seeds. It is an annual plant, cultivated extensively in some parts of India for its fiber, which is used in the manufacture of paper, cordage, canvas, and cloth. The plant has a slender stem about 8 feet high.

Dhyána: a Sanskrit word meaning contemplation or meditation. Its Páli equivalent is *jhána*. It is used in Buddhism to denote (1) a kind of abstract contemplation intended to destroy all attachment to existence in thought or wish, and thus as a means of arriving at Nirvána; and (2) one of four groups of heavens called Brahmalokas, corresponding to the four degrees of stages of this mystic contemplation. (See DEVALOKAS.) In the first stage of Dhyána the mind is so fixed that while the thinking faculties are exercised a state of tranquil joy is attained. Those who arrive at this stage are re-born in one of the three heavens which constitute the first Dhyána or group of Brahmalokas. In the second stage the meditation has been carried on so far that only the tranquil joy remains. This insures re-birth in the second Dhyána or group of heavens. In the third everything but tranquillity is eliminated, and re-birth in one of the third group of Brahmalokas is the result. In the fourth stage the whole being is freed from every fetter which would bind to existence, a condition of indifference is reached, and six kinds of supernatural wisdom as well as ten kinds of supernatural miracle-working power are acquired. Those who attain to this condition are re-born in one of the seven highest heavens in which bodily form still continues. R. L.

Dhyáni-Buddhas: incorporeal beings who exist in "the formless worlds of meditation" (i. e. the four Brahmalokas situated above the sixteen worlds of form), as the spiritual counterparts and representatives of those Buddhas who appear on the earth from time to time to teach men how to attain to Nirvána. The Dhyáni-Buddhas of the present Kalpa or age are five in number, corresponding to the three Buddhas who had preceded Gautama Buddha, to Gautama himself, and to Maitreya the coming Buddha. The Dhyáni-Buddha, corresponding to Gautama, the historical Buddha who appeared in India, is *Amitábha*, the Buddha of "boundless light." He presides over the "Paradise of the West," and among Northern Buddhists is the most popular of all the Buddhas. See TSING-TU and SHINSHIU. R. L.

Diabase: an igneous rock of the trap family, and therefore related to BASALT, GABBRO, etc. (*qq. v.*). The term was first proposed by Brongniart in 1813 (in allusion to its two-fold composition) for the same rock which was more generally known as diorite. The name, therefore, was superfluous until Hausmann revived it in 1842 for eruptive rocks composed of pyroxene and labradorite feldspar. Chemically and mineralogically diabase is about identical with basalt and gabbro. It is distinguished from these by its structure, which is its chief characteristic. Its feldspar is in well-formed, lath-shaped crystals, in the irregular spaces between which lies the younger pyroxene. The rock differs from basalt in being coarser and in containing little or no glass. Its peculiar structure is called *diabase* or *ophitic* structure. All diabase contains iron oxide in the form of magnetite or ilmenite; some diabases also contain olivine as a fourth constituent.

In general appearance diabase is dark, heavy, and compact, and it is the best representative of the rocks popularly known as trap or nigger-head. The rock has not usually cooled at the surface, but occurs either in dikes or intrusive sheets. It disintegrates into irregular or spherical boulders, and gives rise to a deep-red soil. Under the influence of intense pressure in the earth's crust diabase is metamorphosed to a green schist composed mostly of hornblende or chlorite.

Economically, diabase has little value except for making foundations, stone-walls, or roads. It is very abundant in Scandinavia and in other parts of Europe; also in the red sandstone formation (Trias) of the Atlantic border region.

GEORGE H. WILLIAMS.

Diabe'tes [Gr. διαβήτης, diabetes, also compass, siphon; its value as a Gr. medical term is derived directly from its etymology, διά, through + βαίνειν, pass, go]: disease characterized by the excessive excretion of urine; occurs in two forms. *Diabetes insipidus*, now called Polyuria (*q. v.*), is distinguished from the other much more dangerous disease by the fact that the urine is very watery, but otherwise not abnormal. It is neither frequent nor formidable. But *Diabetes mellitus*, "sweet" or "honeyed diabetes" (*Glycosuria*), is often one of the most incurable and serious of diseases. The urine is light colored, but has its specific gravity greatly increased by the presence of diabetic sugar, a substance believed to be identical (in most cases) with liver-sugar, and very closely approaching grape-sugar in its composition and reactions. In some cases it appears to be muscle-sugar (*inosite*). The disease is further characterized by excessive appetite, intense thirst, wasting, and prostration of mind and body. Its causes are obscure and its treatment not well understood. Some cases are greatly benefited by opium, the avoidance of sugars and starchy food, and the use of strictly nitrogenous diet, like gluten bread and skim milk. A milder form of diabetes is not infrequent in the obese and those of gouty habits. After a variable duration the glycosuria may in these cases cease entirely; and there is rarely much disturbance of the general health. Temporary diabetes has been observed after the administration of laughing-gas, chloral, chloroform, woorari poison, and other drugs.

Revised by William Pepper.

Diacaustics: See Caustic.

Diadem [from Gr. διάδημα, fillet, band about the head; διά, through + δεῖν, bind]: the symbol of royalty among several Oriental nations; originally a fillet wound round the forehead and temples. Among the Persians the diadem was a broad light-blue band made of silk, linen, or wool, bound round the tiara or turban, and from them it was borrowed by Alexander the Great. The Ptolemys of Egypt and the Seleucidæ of Syria used plain fillets of gold encircling the head. Mark Antony assumed the diadem, but Diocletian was the first Roman emperor who adopted it. After his time it was embroidered with gold and adorned with pearls or precious stones.

Diagno'sis [Gr. διάγνωσις, discrimination, decision, connected with διαγιγνώσκειν, to discern; διά, apart, through + γιγνώσκειν, know]: the discovery of the nature and seat of disease, one of the most difficult and important branches of medicine and surgery. Diagnosis is based upon "physical signs and rational symptoms"; "signs" being appreciable by the senses, and "symptoms" arrived at by the educated judgment. Both, however, are popularly known as symptoms. Diagnosis is best learned at the bedside, under the guidance of good instructors. The stethoscope, thermometer, laryngoscope, etc., furnish important aid in this branch of medical practice. The term is often used by naturalists for the discrimination of species of animals, plants, or minerals.

Diagom'eter [an irreg. mod. compound from Gr. διάγειν, conduct + μέτρον, measure]: electric instrument for determining the conducting power of fixed oils, invented by M. Rousseau. It consists of a dry pile, by means of which a current is passed through the oil, and the strength of the current determined by a magnetized needle. It is used especially for the detection of the adulteration of olive oil, said to have the lowest conducting power of such oils.

Diagonal [from Gr. διαγώνιος, from angle to angle: διά, through + γωνία, angle]: a straight line drawn through a figure, joining two opposite angles. The term is chiefly used in geometry in speaking of four-sided figures, but it is also properly applied with reference to all polygons of more than three sides. Euclid uses the term *diameter* in the same sense, but modern geometers use diameter only when speaking of curved lines.

Diag'oras (in Gr. Διαγόρας): Greek poet and philosopher; born in the island of Melos; lived about 425 B. C., and is said to have been a disciple of Democritus of Abdera. He was a citizen or resident of Athens. As he rejected or doubted the popular religion and polytheism, he was stigmatized as an atheist. He fled from Athens in 411 B. C., or, as some say, was banished for impiety. He appears to have been a witty and fearless man of good moral character. His works are not extant. He lived at Pallene for a time, and then removed to Corinth, where he died. See Reuthen, *De Atheismo Diagoræ*, 1812.

Dial [from Lat. *dialis*, daily, pertaining to the day, deriv. of *dies*, day]: instrument showing the hour of day by the shadow of a gnomon or style cast by the sun on a gradnated arc; also called Sundial. The invention is of great antiquity, the Grecks having, it is said, learned its use from the Chaldæans. In the construction of a dial the object is to find the sun's distance from the meridian by means of the shadow. When this is known, the hour also is known, provided we suppose the sun's apparent motion to be uniform, and that it moves in a circle parallel to the equator during the whole day. In point of fact, neither of these conditions is fulfilled, but the error arising from this is of small amount. Although dials have many different constructions, the general principles are the same. The style, gnomon, or axis of the dial is either a cylindrical rod or the edge of a thin plate of metal. It must be parallel to the earth's axis, and thus it may be considered, on account of the smallness of the earth's diameter compared with the distance of the sun, as coinciding with the axis of the diurnal rotation: consequently the plane which passes through the center of the sun and the style will coincide with the shadow, and will turn with the sun, as the sun turns round the style, by the effect of the diurnal motion. Dials are horizontal, vertical, or inclined, according to the position of the plane of the dial with respect to the horizon of the place. The essential principle is that the rod shall point to the pole of the heavens.

Dialectic [from Gr. ἡ διαλεκτική (sc. τέχνη, art), the art of discussion, femin. of adjec. διαλεκτικός, pertaining to discussion, conversation, Gr. διάλεκτος]: technical term much used in both Greek and German philosophy, but of a somewhat vague signification. In the Greek philosophy it may be best explained by considering it in its relation to logic. Logic was the science of the forms of thinking, the science of conclusion and evidence; it taught the manner by which to arrive at truth. Dialectic treated of the truths arrived at; it was the science of expressing and setting forth ideas, the science of definition. With an idealistic thinker like Plato, with whom truth is an intuition and the idea an inspiration, dialectic, the science of definition, the art of defining, means the highest function of science—science itself. With a realistic thinker like Aristotle, with whom truth is the result of induction and deduction, and the idea an evidence, dialectic means only a part, and even an inferior one, of logic. Hence the multitude of contradictions which invest this word. In the German philosophy it may be best explained by considering it in its relation to the expression "dogmatical." Dogmatical is applied to a definition when it excludes absolutely the opposite; "dialectical," when it combines the opposites as correlatives. According to the dogmatical definition, everything is either good or bad; and if it is good, it is not bad; if it is bad, it is not good. According to the dialectic definition, anything which is essentially good may have some bad in it, and anything which is essentially bad may have some good in it. According as the object passes under different views, the different constituents of the idea shift place and importance in the definition; relativity is the character of the actual world, relativity must be the character of the world of thought. Both in the Greek and German philosophy the word *dialectic* is sometimes used to signify a mere word-fence.

Dialects [from Gr. ἡ διάλεκτος (sc. γλῶσσα), conversational language, discourse, conversation, deriv. of διαλέγεσθαι, discuss, argue, converse]: various modes of speech regarded as local and divergent forms of a central or standard language, or as closely related descendants from a common original. In the latter, which is the less frequent meaning, the word is used, for instance, of the four traditional forms of the Greek language—the Attic, Ionic, Doric, and Æolic dialects—and it was in this sense and in connection with these that it was first appropriated to grammatical use by the Greek grammarians. The common popular view, that dialects represent a debased or perverted form of the standard language, is in general nearly the reverse of the truth. The standard, sometimes known as the literary language, is generally based historically upon one of a number of sister dialects, but is generally more or less of an artificial structure, including compromises and mixtures with various dialects. It is called into being by the practical necessities of intercommunication in some form of centralizing civilization, and corresponds in its materials and shape, as well as in the extent of its recognition, to the controlling factors and constituency of that civilization. The dialects, so far-

as they survive, represent the continuance of language in its natural growths and according to the natural laws of its development. Hence arises the surpassing importance of the dialects for all study of the life and growth of language, and as the only natural growths they furnish also the only reliable norms for determining the development and testing the materials of the standard language.

The demands of exact scientific grammar have in recent years directed the attention of philologists more particularly to the study of the folk-dialects, and in every province of historical grammar great activity has been shown in the collection and arrangement of dialectal material. For the English dialects a large amount of valuable material has been collected in the publications of the English Dialect Society. Of pre-eminent value is *The Existing Phonology of English Dialects, compared with that of West Saxon Speech*; part v. of *Early English Pronunciation*, by A. J. Ellis (1889). Among a great number of valuable works are also to be mentioned as peculiarly representative of the modern method of scientific language study, J. A. H. Murray, *The Dialect of the Southern Counties of Scotland: its Pronunciation and Historical Relations* (1873); C. C. Robinson, *An Outline Grammar of the Mid-Yorkshire Dialect*; J. Wright, *The Yorkshire Dialect of Windhill, Shipley* (1893). A compendious dictionary of the English dialect is now in preparation under the auspices of the English Dialect Society. A bibliography of the most important existing material in glossaries and grammars is to be found in the article on the *English Dialects* by Joseph Wright in Paul's *Grundriss der german. Philologie*, vol. i., pp. 975 ff. (1891).

The dialects of the U. S. have not as yet been clearly defined and characterized, but collections of material with this in view are now being made by the American Dialect Society, and are published in the *Dialect Notes* (1890–92); five parts have appeared. A sample investigation of a local dialect is O. F. Emerson, *The Ithaca Dialect* (1891). Valuable bibliography will be found in parts i., ii., and v. of the *Dialect Notes*.

For the study of the relation of dialects to each other and to the standard, the history of the German language affords a particularly instructive field; cf. A. Socin, *Schriftsprache und Dialekte im Deutschen nach Zeugnissen alter und neuer Zeit* (1888); Jostes, *Schriftsprache und Volksdialekte*, *Jahrbuch des Vereins für nieder deutsche Sprachforschung*, vol. xi.; F. Kluge, *Von Luther bis Lessing* (2d ed. 1888). Sample investigations of local dialects may be found in J. Winteler, *Die Kerenzer Mundart in ihren Grundzügen dargestellt* (1876); F. Holthausen, *Die Soester Mundart* (1886). Maps of the dialect boundaries are to be found in Peschel und Andree, *Physicalisch-statistische Atlas des deutschen Reiches*, Karte x. (1877); Bernhardi-Stricker, *Sprachkarte von Deutschland* (2d ed. 1849); map accompanying Behaghel's *Geschichte der deutschen Sprache* in Paul's *Grundriss*, vol. i.

For the dialects of France and the abundant literature of the subject, cf. H. Suchier, *Gröber's Grundriss der roman. Philol.*, i., 592 ff.; for the dialects of the other Romance languages, cf. Gröber, *Grundriss*, i., 426 ff. (an enumeration and classification of the entire body of dialects); T. Gartner, *Gröber's Grundriss*, i., 461 ff.; F. D'Ovidio, *Gröber's Grundriss*, i., 548 ff. (*Italian Dialects*).

The best and most recent summaries of the work in the Greek dialects are contained in R. Meister, *Die griechischen Dialekte*, 2 vols., appeared 1882–89; Hoffmann, *Die griechischen Dialekte*, 2 vols., appeared 1891–93.

Benj. Ide Wheeler.

Dialogue [from Gr. διάλογος, conversation, dialogue, deriv. of διαλέγεσθαι, converse; διά, between two, through + λέγειν, speak]: originally a discourse between two or more persons. In literature, a composition in the form of a conversation between two or more individuals. The dialogue was the form most generally adopted by the ancients for the conveyance of instruction, and was considered applicable to the gravest and most philosophical subjects. It was adopted by Plato, Cicero, and Lucian with great success. The philosophical dialogue has also been employed by several eminent modern writers, as Fénelon, Fontenelle, Macchiavelli, Berkeley, Lessing, and Herder. In the drama, dialogue is combined with action, and those dramas which are not written for the stage differ from the dialogue chiefly in having a plot and a *dénoûment*, while the dialogue is more strictly didactic.

Dial'ysis [Gr. διάλυσις, dissolution; διά, in two + λύειν, loose]: the separation of certain substances by means of liquid diffusion. The dialyzer is usually a hoop on a low, broad glass bell-jar, open above as well as below. A piece of wet parchment paper is stretched over the hoop and securely tied in place. The fluid to be dialyzed is poured into the hoop to the depth of half an inch, and the whole is floated on distilled water. Crystallizable bodies, as common salt, nitrate of potassa, etc., and bodies closely allied to them, such as hydrochloric acid and alcohol, pass rapidly through the membrane into the water; while bodies which do not crystallize, but are inclined to assume the gelatinous form, such as silicic acid, hydrated alumina, starch, gum, caramel, tannin, albumen, gelatine, and extractive matters, diffuse with extreme slowness. Such bodies are called *colloid*, from κόλλη, glue. When a mixture of sugar and gum was placed in the dialyzer, three-quarters of the sugar passed through in twenty-four hours, without a trace of the gum. On treating silicate of soda (soluble glass), acidulated with hydrochloric acid, in the same way, seven-eighths of the silicic acid was left in the dialyzer at the end of five days, without a trace of hydrochloric acid or chloride of sodium. Urine dialyzed for twenty-four hours gave a liquid so free from mucous and gelatinous matter that on evaporating to dryness and extracting with alcohol a solution was obtained which gave pure urea in crystalline tufts.

The purification of soluble colloids is best effected by dialysis; they are thus completely freed from crystalloids. A solution of pure hydrated alumina is obtained by dialyzing its solution in the chloride or acetate. In a similar manner may be obtained, *in solution*, hydrated sesquioxide of iron and of chromium; Prussian blue from its solution in oxalatic acid; an aqueous solution of silicic acid from silicate of soda and hydrochloric acid; pure albumen from albumen and acetic acid; pure gummic acid from gum-arabic (gummate of calcium) and hydrochloric acid. Mr. Whitelaw was granted a patent for the application of dialysis to brine from salted and corned meats. The salt and niter pass rapidly through the parchment paper, while the nutritious extractive matters dissolved out of the meats are retained, and may be used for soup. For the application of dialysis to the purification of beet-molasses, see Endosmose.

Dialysis is specially useful in examining animal fluids for poisons where the presence of the colloids interferes with the ordinary tests. Arsenious acid may be readily separated in twenty-four hours from the contents of a stomach in sufficient purity to be immediately recognized by the usual tests. Tartar emetic, morphine, strychnine, and, in fact, almost all soluble poisons, may be thus separated.

Decompositions are also effected by dialysis. Bisulphate of potassa is partially separated into neutral sulphate and hydrated sulphuric acid; alum is partially separated into sulphate of alumina and sulphate of potassa; sulphate of potassa and lime-water yield considerable hydrate of potassa and sulphate of lime. Separations and decompositions of this kind undoubtedly occur in plants and animals, and in the soil; and dialysis is probably one of the most common processes in nature. See Watts's *Dictionary of Chemistry*, under *Liquids, Diffusion of*; also the original papers of Prof. Graham, who minutely investigated this subject, in the *Philosophical Transactions* (1850 and 1862), and in the *Journal Chem. Soc.* (iii., 60, 257; iv., 83; xv., 216).

C. F. Chandler.

Diamagnetic Polarity: the polarity imparted under certain conditions to substances which have been magnetized by means of an electric current. If a bar of iron be placed in a helix or spool of copper wire, through which circulates a current of electricity, the bar will be magnetized, and the end of the bar round which the current passes in the same direction as the motion of the hands of a watch will be a south magnetic pole. When a bar of bismuth replaces the bar of iron, the end above mentioned becomes a north magnetic pole—that is, bismuth has its poles the reverse of iron when it is placed in the same conditions of magnetization. Weber held to the opinion of the reversed polarity of bismuth, but Faraday denied any such condition. Tyndall settled the question by a series of experiments of great delicacy made with an apparatus designed for that purpose by Weber, and proved conclusively the existence of reversed polarity, not only in bismuth, but also in other diamagnetic solids and liquids.

A. M. Mayer.

Diamagnetism: phenomena exhibited by certain substances which under the influence of magnetism place them-

selves with the longer axis at right angles to the magnetic lines of force.

The line joining the two opposite poles of a horseshoe magnet is called the *axial* line, while a line bisecting at right angles this axial line is called the *equatorial* line of the magnet. The space included between the opposite polar surfaces of the magnet is called *the magnetic field*. When small bars of iron, nickel, cobalt, manganese, etc., are suspended between the poles of a magnet, they place their lengths in the axial line. Substances taking the above position are called magnetic substances, or, as Faraday termed them, *paramagnetic* substances. The majority of bodies, however (e. g. bismuth, antimony, phosphorus, heavy glass, wood, water, blood, bread, hydrogen, and ammonia), when delicately suspended in the magnetic field, place their lengths equatorially, and to distinguish them from magnetic substances they were called *diamagnetic* (διά, across, and μάγνης, the magnet) by Faraday, who, in Dec., 1845, gave the discovery of diamagnetism to the world in a paper read before the Royal Society of London.

The difference in the behavior of magnetic and diamagnetic substances in the magnetic field was thus concisely stated by Faraday: Magnetic substances tend to go from weaker to stronger places of magnetic action, while diamagnetic bodies tend to go from stronger to weaker places in the magnetic field.

Faraday found that not only solids, but also liquids and gases, possessed magnetic and diamagnetic properties. In experimenting with these bodies he inclosed them in glass tubes, whose magnetic behavior was determined before they were filled with the liquids or gases to be examined, and the previously determined action of the magnet on the empty tube was deducted from the resultant magnetic effect on both the tube and its contained liquid or gas. Or two tubes of exactly the same size and material were hung opposite each other from the ends of a short piece of light wood, which was then placed across the end of a longer wooden rod, and the latter was suspended by silk fibers or by a fine silver wire. The two tubes hung on opposite sides of the axial line of the magnet, and with their centers equidistant from it. By this ingenious arrangement the actions exerted by the magnet on the glass tubes neutralized each other, and whatever motion he observed was due to the difference in the action of the magnet on the two substances they contained. By filling one of the tubes with water or air, and the other successively with different liquids and gases, he determined *the specific magnetism* of these substances relatively to water or air taken as unity. Further experiments on the action of the magnetic field on water and air inclosed in a vacuum gave the data for reducing all of his measures to what he would have found had all the substances been suspended *in vacuo* between the poles of the magnet. Plücker in Germany and E. Becquerel in France also made extensive researches in this field, and obtained very refined measures of these actions.

In the following table are contained the results of Faraday's measures of the actions of attraction or repulsion of magnetism on various substances, determined by means of a delicate torsion balance. In the comparisons equal volumes of the substance were used, and the action on water taken as the unity of intensity. The sign + indicates that the substance is magnetic, while the sign − shows that it is diamagnetic:

TABLE OF SPECIFIC MAGNETISM.

SUBSTANCES.	Powers.	SUBSTANCES.	Powers.
Iron	*+100,000	Absolute alcohol	−0·815
Protochloride of iron (saturated solution)	+62·0	Essence of citron	−0·828
Protoammoniuret of copper	+1·390	Camphor	−0·855
Perammoniuret of copper	+1·240	Camphine	−0·859
Oxygen	+0·181	Linseed oil	−0·886
Air	+0·035	Olive oil	−0·886
Olefiant gas	+0·006	Wax	−0·887
Nitrogen	+0·003	Nitric acid	−0·911
Carbonic acid	0·000	Liquid ammonia	−1·010
Hydrogen	−0·001	Bisulphide of carbon	−1·031
Ammonia (gas)	−0·005	Nitrate of potassa (saturated solution)	−1·036
Cyanogen	−0·009	Sulphuric acid	−1·081
Glass	−0·188	Sulphur	−1·221
Zinc	−0·772	Chloride of arsenic	−1·260
Ether	−0·797	Borate of lead	−1·413
		Bismuth	−20·369

* Weber's value. Becquerel's value is 2,080,000 if we take the saturated solution of protochloride of iron at 62.

The following tables contain additional measures by Becquerel:

SOLIDS.

Ice	−1·00	Selenium	−1 65
Zinc	−0·25	Pure copper	−1·71
White wax	−0·57	Pure silver	−2·35
Pure sulphur	−1·14	Pure gold	−3·50
Lead	−1·53	Bismuth	−21·76
Phosphorus	−1·64		

LIQUIDS.	Density.	
Water	.....	−1·00
Sulphide of carbon	.....	−1·30
Alcohol	.....	−0·79
Chloride of sodium	1·208	−1·13
Sulphate of copper	1·126	+0·81
Sulphate of nickel	1·082	+2·16
Sulphate of iron	1·192	+21·11
Sulphate of iron	1·172	+18·02
Protochloride of iron	1·069	+9·19
Protochloride of iron	1·276	+36·07
Protochloride of iron (saturated solution)	1·433	+55·81

The general law of these actions was discovered by Faraday, and Becquerel has formally stated it as follows: If we place in the neighborhood of a magnetic pole a fixed vessel filled with a fluid, the latter will experience no motion. Imagine any portion of the interior of the fluid mass isolated; it is solicited, according as it is magnetic or diamagnetic, by a force f, positive or negative; and as it is not displaced, the medium which surrounds it must necessarily exert on it an equal and contrary pressure equal to $-f$: this is to say, that the principle of Archimedes applies as well to these forces as to gravity. Replace now the mass of the fluid we supposed isolated from the same fluid surrounding it by another which is bounded by the same surface as the former, but of a different magnetic nature; it will receive from the magnet a different action f^1, positive or negative, and from the surrounding fluid the same action as above, f; the resultant action on the new substance will be $f^1 - f$. Consequently, the action which the pole of a magnet exerts on any body whatever, plunged in a fluid medium, is equal to the difference of the actions which it exerts separately on this body and on the fluid in which it is suspended.

From these considerations the following consequences result: When the medium is magnetic, f is positive, and $f^1 - f$ is negative; consequently, any body whatsoever tends to become diamagnetic in a magnetic fluid or medium. Conversely, in a diamagnetic medium f is negative, and $-f$ is positive; and the substance may act as though it were magnetic, even when it really is not when tested in a vacuum, and will become more diamagnetic when it really is diamagnetic when suspended in a vacuum between the poles of the magnet.

Faraday beautifully illustrated the above principle by the following ingenious experiments: He filled glass tubes with solutions of sulphate of iron (a magnetic substance) of different degrees of strength, and suspended them between the poles of his magnet in similar solutions, also of different degrees of strength. When the solution in the tube was stronger, or contained *more* iron, than that in the solution in which it was suspended, it pointed *axially*: when it was weaker, or contained *less* iron, than that in the surrounding liquid it pointed *equatorially*; and when the solution in the tube and outside of the tube were of the same degree of strength the tube was indifferent.

In Sept., 1847, Bancalari, of Italy, discovered that when the flame of a candle was placed between the poles of an electro-magnet it was deflected into the equatorial line the moment the iron of the magnet was magnetized, and the flame returned to its first position when the magnet was demagnetized. Faraday repeated these experiments with the powerful magnet of the Royal Institution, and greatly extended these observations by his discovery of the magnetic character of oxygen, olefiant gas, and nitrogen, when these gases were contained in tubes and placed in a vacuum in the magnetic field; and observed that hydrogen, cyanogen, and ammonia were diamagnetic when placed in similar conditions. Faraday made many important experiments on the effects of the change of temperature and pressure in modifying the magnetic conditions of gases, and found that the action in the magnetic field on these bodies diminished with an elevation of their temperature and a diminution of their density. Thus hot air is shown to be diamagnetic when allowed to ascend through cold air between the poles of the magnet. This and other similar facts he showed by causing the currents of gas in their progress toward the magnetic field to pass over pieces of paper saturated with chlorhydric

acid, while between, around, and above the poles were placed little tubes moistened with ammonia. When the gases entered one of these tubes the fact was known by the formation in it of white fumes of chloride of ammonium. He thus found that the heated air on reaching the magnetic field was repelled from the poles, while a descending current of cold air was attracted toward the poles.

The writer of this article has devised a method of observing these phenomena by passing through the gases, as they ascend or descend or pass between the poles, a strong diverging beam from an electric light. The difference in refracting power of the hot or cold gas currents and the surrounding air causes shadows of the currents to be projected on a screen placed on the side of the magnet opposite the light; and thus can be seen at once all the parts of the phenomena. In these experiments the powerful electro-magnet of the Stevens Institute of Technology was used. With this magnet the experiments of Bancalari are very remarkable. On bringing the flame of a candle slowly upward between the poles of the magnet the top of the flame is first depressed and spread out equatorially in the magnetic field; as the flame is elevated it spreads out yet more, and often takes the form of an oval-shaped vase flattened equatorially, with an anterior depression extending down nearly to the base of the wick. A larger flame becomes compressed into a flattened elliptical dish, with two curved arms or handles projected upward.*

After Faraday had discovered the magnetic properties of oxygen, he experimentally determined that one cubic meter of this gas equaled in magnetic effect 54 centigrammes of iron, and hence that the whole atmosphere acted as would a layer of iron which enveloped the earth and had a thickness of $\frac{1}{10}$ mm. Parts of this gaseous magnetic shell are successively heated—and therefore weakened in magnetic intensity—by the sun in his apparent daily and yearly changes of position; and hence Faraday reasoned that here was certainly a true, and probably a sufficient, cause of the diurnal variation of the needle. (*Phil. Trans. R. S.*, Nov., 1850.)

The results of Faraday's experiments on the action of the magnetic field on gases are given in the following table. A gas which is magnetic in the circumstances stated in the top line of the table has + before it. If it is diamagnetic it has — before it.

GASES.	In air.	In carbonic acid.	In hydrogen.	In coal gas.
Air	O	+	+weak	+
Nitrogen	—	—	—strong	—
Oxygen	+	+	+strong	.....
Hydrogen	—strong	—	O	.....
Carbonic acid	—	O	—	—weak
Carbonic oxide	—	—	—	—weak
Nitrous oxide	—	—weak	—	.....
Nitric oxide	—? weak	+	+	.....
Nitrous acid	+? weak	.....	.....	.....
Olefiant gas	—	—	—	—weak
Coal gas	—strong	—	.....	O
Sulphuric acid	—	.....	.....	.....
Hydrochloric acid	—	—	—? weak	.....
Hydriodic acid	—	.....	.....	.....
Fluosilicic acid	—	.....	.....	.....
Ammonia	—	—	—	.....
Chlorine	—	.....	—weak	.....
Iodine	—	.....	.....	.....
Bromine	—	.....	.....	.....
Cyanogen	—strong	.....	.....	.....

Becquerel (*Comptes Rendus*, 1881) has found that ozone is more magnetic than oxygen.

Faraday, in the course of his experiments on bars of bismuth, met with the following anomalous actions. He found that some cast bars of bismuth pointed axially, others equatorially, while yet other bars took intermediate positions of rest. These extraordinary phenomena both he and Plücker, of Germany, endeavored to explain, and they both observed that there was some relation between the positions of crystals in the magnetic field and their crystalline forms. The phenomena received their full explanation at the hands of Tyndall.

Tyndall's discoveries can best be made clear by quoting from his paper *On Diamagnetism and Magne-crystallic Action* (*L., E., and D. Phil. Mag.*, July, 1850) the following experiments, and giving in his own words the law which embraces their characteristic phenomena: "If we take a slice of apple about the same size as a penny, but somewhat thicker, and pierce it through with short bits of iron wire in a direction perpendicular to its flat surface, such a disk, suspended in the magnetic field, will, on the evolution of the magnetic force, recede from the poles and set its horizontal diameter strongly equatorial; *not* by repulsion, but by the attraction of the iron wires passing through it. If, instead of iron, we use bismuth wire, the disk, on exciting the magnet, will turn into the axial position; *not* by attraction, but by the repulsion of the bismuth wires passing through it.

"If we suppose the slice of apple to be replaced by a little cake made of a mixture of flour and iron filings, the bits of wire running through this will assert their predominance as before; for, though the whole is strongly magnetic, the superior energy of action along the wire will determine the position of the mass. If the bismuth wire, instead of piercing the apple, pierce a little cake made of flour and bismuth filings, the cake will stand between the poles as the apple stood; for though the whole is diamagnetic, the stronger action along the wire will be the ruling energy as regards position.

"Is it not possible to conceive an arrangement among the particles of a magnetic or diamagnetic crystal capable of producing a visible result similar to that here described? If, in a magnetic or diamagnetic mass, two directions exist, in one of which the contact of the particles is closer than in the other, may we not fairly conclude that the strongest exhibition of force will be in the former line, which therefore will signalize itself between the poles in a manner similar to the bismuth or iron wire? . . .

"If analogic proof be of any value, we have it here of the very strongest description. For example: bismuth is a brittle metal, and can readily be reduced to a fine powder in a mortar. Let a teaspoonful of the powdered metal be wetted with gum-water, kneaded into a paste, and made into a little roll, say an inch long and a quarter of an inch across. Hung between the excited poles, it will set itself like a little bar of bismuth—equatorial. Place the roll, protected by bits of pasteboard, within the jaws of a vice, squeeze it flat, and suspend the plate thus formed between the poles. On exciting the magnet the plate will turn, with the energy of a magnetic substance, into the axial position, though its length may be ten times its breadth.

"Pound a piece of carbonate of iron into fine powder, and form it into a roll in the manner described. Hung between the excited poles, it will stand as an ordinary magnetic substance—axial. Squeeze it in the vise and suspend it edgeways, its position will be immediately reversed. On the development of the magnetic force the plate thus formed will recoil from the poles *as if violently repelled*, and take up the equatorial position.

"We have here 'approach' and 'recession,' but the cause is evident. The line of closest contact is perpendicular in each case to the surface of the plate—a consequence of the pressure which the particles have undergone in this direction; and this perpendicular stands axial or equatorial according as the plate is magnetic or diamagnetic."

Prof. Tyndall thus sums up the law which rules all of these actions: "If the arrangement of the component particles of any body be such as to present different degrees of proximity in different directions, then the line of closest proximity, other circumstances being equal, will be that chosen by the respective forces for the exhibition of their greatest energy. If the mass be magnetic, this line will stand axial; if diamagnetic, equatorial."

The above law explains clearly the anomalous actions Faraday observed in his bars of bismuth. Bismuth is a crystallized body, and the lines of greatest proximity of its particles are in the direction of its cleavage planes. Therefore this line of greatest condensation will always place itself equatorially in the magnetic field. In other words, the planes of cleavage will take an equatorial direction. But in casting bars of bismuth, these planes may, on the solidification of the bismuth, take various positions in reference to the length of the bars; hence the anomalous actions which are sometimes observed in these bars.

When the crystal cleaves equally easy in two planes, the lines of greatest compression will be parallel to both of these planes, and therefore the intersections of these planes

* It is not necessary to use the intense field of a powerful electro-magnet to obtain the phenomena of diamagnetism. The writer has successfully used the magnetic field of a steel horseshoe magnet made by Van Wetteren, of Haarlem, Holland. This magnet is formed of five plates. The legs are 26 cm. long, with a cross section of 4 by 3 cm. In the field of this magnet bismuth shows itself strongly diamagnetic, and even a parallelopiped cut out of a banana points equatorially.

will determine the position the crystal takes in the magnetic field. This is confirmed by experiment.

If there are three cleavage planes, perpendicular to each other, as in rock-salt, or if there are none, as in quartz, there will be no line of elective polarity, and the body will act as though it were not crystallized.

Finally, when three planes of cleavage are not perpendicular, there is generally one direction of greatest compression, which is found—for example, in calc-spar—parallel to the axis of crystallization; this line will place itself axially if the crystal is magnetic, and equatorially if it is diamagnetic. This deduction has been confirmed by experiment.

Villari (Pogg. *Ann.*, 1879) has made experiments to find *the time necessary to produce the maximum diamagnetization.* A disk of flint-glass was rotated in a magnetic field with the axis of rotation of the disk perpendicular to the polar axis of the magnet, so that the diameter of the disk was in the direction of the lines of force of the magnetic field. A beam of polarized light was passed through the disk in the direction of its diameter. When the disk was stationary the flint-glass disk caused a rotation of the plane of polarization equal to 19 divisions. Velocities of rotation of the disk of 110, 121, 143, and 180 turns per second reduced the rotation of the plane of polarization by 2, 5, 10, and 17 divisions, respectively. Villari concluded from these experiments that $\frac{1}{800}$ second is required to produce a diamagnetization sufficient to be detected by the rotation of the plane of polarization, that $\frac{1}{4\,1\,4}$ second is required to develop the maximum diamagnetization of flint-glass, and that its diamagnetism lasts $\frac{1}{5\,5\,5\,5}$ second after the magnetic inducing force has disappeared. ALFRED M. MAYER.

Diamantina, dĕĕ-ăă-măăn-tee′năă (formerly TEJUCO): a city of Brazil in the northern part of the state of Minas Geraes; near the eastern base of the principal chain of the Serra do Espinhaco, about 4,000 feet above the sea (see map of South America, ref. 6–G). It is built partly on the steep sides of a hill and partly on level ground above, presenting a curious appearance when seen from a distance. The surrounding country is watered by numerous streams, affluents of the Jequitinhonha. Diamantina owed its first importance, as well as its name, to the rich diamond washings of the vicinity; these are by no means exhausted, but since the discovery of the South African diamond-fields they have been in great part abandoned. The city retains its position as a center for the trade of Northern Minas. It is the seat of a bishop, and has numerous churches. Pop. about 10,000. HERBERT H. SMITH.

Diamantino: city of Brazil; province of Matto Grosso; on a small tributary of the Paraguay. It was founded in 1730, and was a very flourishing place for a time after the discovery of diamonds in 1746, but now numbers less than 2,000 inhabitants, mostly Indians. The chief products are ipecacuanha and vanilla.

Diameter [from Gr. *ἡ διάμετρος* (sc. *γραμμή*, line), the line measuring the distance across; *διά*, across + *μέτρον*, measure]: a right line drawn through the center of a circle, and terminated in both directions by the circumference. In architecture diameter is the measure across the lower part of a classic shaft or column, and is used as a convenient scale of relative dimension for the various parts of an order. Some writers, following the Italian tradition, arbitrarily divide the diameter into two *modules* and twenty-four to sixty *parts* or *minutes*, according to the order. In astronomy the apparent diameter of a celestial body is the angle which the latter subtends at the eye, and is measured by the micrometer. The distance of the body in question from the earth, when multiplied by the sine of this angle, gives the real diameter of the body. In elementary geometry diameter is any right line through the center of a figure. In conics a diameter always bisects a system of parallel chords. Newton showed that the centers of mean distances upon a system of parallel lines, of the n intersections of each with a curve of any order, always lie on a right line, which may be called a diameter. A diameter of any curve is simply the polar line with respect to the curve of an infinitely distant point. The rth diameter is the rth polar of an infinitely distant point, and consequently a curve of the $(n-r)^{\text{th}}$ order. The $(n-2)^{\text{th}}$ diameter is called the diametral conic, the $(n-3)^{\text{th}}$ the diametral cubic, etc. The same extension is applicable to surfaces. When the primitive surface is of the second order, there is but one diametral surface, and that is the diametral plane which bisects a system of parallel chords. Three diametral planes so situated with respect to each other that each bisects all chords parallel to the intersection of the other two, constitute a system of conjugate diametral planes, and intersect each other in conjugate diameters.

Diamond [M. Eng. and O. Fr. *diamant*: Ital. and Span. *diamante* < Lat. *a′damas, -antis*, with change of *da-* to *dia* under influence of Gr. prefix *dia*. Lat. *adamas*, adamant, is a loan from Gr. *ἀδάμας, -αντος*, unconquerable, a hard metal; *ἀ-*, not + *δαμᾶν*, to subdue]: a mineral which is the hardest known substance, and the only gem that is combustible or that phosphoresces by attrition. Certain blue-white Brazilian diamonds phosphoresce in the dark after exposure to the sunlight. Diamonds can be split by cleaving them on the cleavage parallel to the octahedron, and are cut by rubbing two of them together until they assume the desired form. They are then polished by being ground on a disk of soft steel about a foot in diameter covered with diamond-dust and oil, the wheel or disk making about 3,000 revolutions per minute. They are generally cut in what is known as the brilliant form, having a flat table surrounded with thirty-two facets on the upper side, the small point called the *culet*, and twenty-four facets on the back. Rose diamonds are flat on the back and brought to a point above, the upper or dome-shaped side consisting of triangular facets. Their weight is but one-third that of a brilliant of the same surface.

At present over 98 per cent. of the diamonds of commerce are produced at or near Kimberley, South Africa, where they have been mined since 1870, in what is known as the blue-stuff, which in fact is an altered peridotite (a volcanic rock) inclosing pieces of a shale rich enough in carbon to be ignited with a match. It is believed that when the volcanic intrusion broke through this shale, the diamonds resulted from the distillation of a volatile hydrocarbon. Since 1868 more than $300,000,000 worth of rough diamonds, worth about $750,000,000 after cutting, have been produced here—more than the entire world's yield for two hundred years before the discovery of these mines. (See DIAMOND-FIELDS OF SOUTH AFRICA.) In Brazil, India, and Borneo, diamonds have always been found in an alluvial deposit, but the mines have almost ceased to yield. Diamonds have been found in Virginia, North Carolina, Georgia, Wisconsin, Idaho, and California, but the entire product of all these States could be held in the palm of the hand.

The largest diamond of modern times is the Victoria or Imperial diamond, purchased by the Nizam of Hyderabad for over $1,500,000. It is a perfect blue-white oblong brilliant, weighing 180 carats. The De Beers light-yellow diamond weighs 225 carats, and was bought by an East Indian potentate. The Regent or Pitt diamond, weighing 136 carats, now in the Galerie d'Apollon in the Louvre, is perhaps overestimated at $2,400,000. The Koh-i-nûr at Windsor Castle weighs $102\frac{3}{4}$ carats. (The stone exhibited with the jewels in the Tower of London is only a glass model.) The largest diamond in America is the Tiffany yellow, weighing $125\frac{3}{8}$ carats. More diamonds weighing over 100 carats each have been found since the opening of the African mines than were known before that time. The Hope diamond, privately owned in England, is almost sapphire blue, and weighs $44\frac{1}{4}$ carats. The Dresden Green, at the Green Vaults at Dresden, Saxony, is a rich light green, and weighs $48\frac{1}{2}$ carats. The red diamond of Czar Paul is at St. Petersburg and weighs 10 carats.

Blue, red, and green diamonds are most highly prized, the red even more highly than the ruby, a $\frac{3}{8}$-carat stone being sold for $1,200. Fine shades of brown and yellow command very high prices. Off-colored and imperfect stones have greatly depreciated in price since the opening of the South African mines, and sell for $50 a carat, and often much less, even when of considerable size. The compact amorphous variety of the diamond known as bort or bortz is found in the provinces of Bahia, Brazil, and is of great value in drilling tunnels and rocks, cutting mill-stones, sawing and turning stone, etc. It must not be confounded with *boart*, the imperfect and flawed variety of crystalline diamond. Diamonds are used extensively for forming splints, for writing on glass and stone, and, in the form of powder, for slitting rock-sections, glass, and in engraving glass and hard stones. GEORGE F. KUNZ.

Diamond-beetle: the common name of a Brazilian beetle belonging to the group of WEEVILS (*q. v.*). It is over an inch in length, black in ground color, with a golden-green band

on the prothorax and the wing-covers with numerous rows of metallic green spots. It is the *Entimus imperialis* of

The diamond-beetle.

naturalists, and receives its common name from its brilliancy.

Diamond-bird (*Pardalotus punctatus*): member of the Dicæum family (*Dicæidæ*); found in Southern Australia and Van Diemen's Land; so named from the white markings on its plumage, which is varied with black, brown, red, and yellow. The bird is 3½ inches long, and builds an elaborate nest at the bottom of a burrow 2 or 3 feet deep.

F. A. L.

Diamond-bird.

Diamond-fields of South Africa: the region in South Africa affording the principal supply of diamonds; situated in Griqualand West, Cape Colony. The farmers along the Orange river near Hopetown had observed stones of striking appearance, but that they were diamonds was not discovered until 1867, when a pebble with which a native boy was playing was found to be a rare gem. Miners began to flock to the neighborhood of Hopetown, and in 1869 a native found a gem of 83 carats, the Star of the South, which was sold for about $60,000. The Orange river fields, however, did not prove profitable, and the discovery of diggings at Pniel, on the Vaal river, about 100 miles N. of Hopetown, drew the crowd. The diamonds of the Vaal, associated with agate, quartz, and chalcedony, are of fine quality, and the diggings yielded (1870–86) more than $10,000,000 worth of gems. But these mines were entirely surpassed after 1870 by the discovery of the diamond-bearing mud craters about 25 miles S. E. of Pniel, where the city of Kimberley (*q. v.*) now stands. The most famous are the Bultfontein, Du Toit's Pan, Kimberley, and De Beers. The Kimberley mine proved to be the richest in the world, its annual product averaging more than $4,000,000. To control the output the four great companies were consolidated in 1887, and the absorption of weaker companies steadily progressed till the entire mining interests came practically under one management.

Cyrus C. Adams.

Diamond Necklace: a celebrated necklace containing 500 diamonds, and valued at 1,800,000 livres (about $400,000); made in 1773–75 by order of Louis XV. for Madame du Barry, his mistress. Before it was finished the king died, and Du Barry was exeluded from court. In the years 1783–84 the Prince-Cardinal de Rohan was persuaded by the so-called Countess Jeanne de Lamotte-Valois, an unscrupulous adventurer, that the Queen Marie Antoinette regarded him with interest, which would be increased if he would assist her in buying the diamond necklace by becoming her surety for the payment of its price to the makers of the ornament, MM. Boehmer and Bassanges. The cardinal agreed to stand surety for the payment. The necklace was delivered to him, but it was stolen, broken up, and sold in pieces. The jewelers, not having received their pay, went to court and made complaint. Cagliostro, the cardinal, and others were thrown into the Bastile. The trial in 1785–86 proved the guilt of no one but the Countess Lamotte, who, with her husband, was branded on each shoulder and sentenced to a life imprisonment, from which she shortly afterward escaped to London, where she died Aug. 23, 1791. The details of the affair attracted very general attention, and were so discreditable to the members of the court that they contributed not a little to the popular tumult which almost immediately after resulted in the French Revolution. See Vizetelly, *The Story of the Diamond Necklace* (new ed. 1880).

Dian'a: Italian divinity; worshiped by the ancient Romans as the goddess of the moon. Her name is, indeed, the feminine form of Janus. She was thought to preside over the woods and the lakes, to govern the changes of human character, more especially those of the female sex, and to lead in chase and war. Worshiped by the Sabines, the Æqui, the Hernici, the Latins, etc., she had sanctuaries among all these tribes; but her most celebrated sanctuary was her grove at Aricia, on the Lake of *Nemi*, whence she was called Nemorensis. The principal festival of Diana was celebrated on the Ides of August—that is, the full moon or the hot season—and torchlight was one of the principal features of the celebration. She was identified by the later Romans with the Artemis of the Greeks. She was supposed to be the daughter of Jupiter and Latona, and the sister of Apollo, with whom she shared his attributes of destruction and healing. She was represented as a virgin armed with bow and arrows, and was regarded as the patroness of chastity. As the goddess of the moon she was often called Selene and Phœbe, and was represented as loving to dwell in groves and in the neighborhood of wells.

Diana: the patron goddess of Ephesus, where she had a splendid temple; different from the Diana of the Latins and Greeks, being rather a personification of the reproductive and nutritive powers of nature, and identical with the divinity called Cybele, or Ma, or Anaitis, whose worship existed in Phrygia, Lydia, Cappadocia, Armenia, and Bactria. Paul's preaching at Ephesus had such an effect upon her worship that the makers of the little shrines which were put in her temple as votive offerings stirred up a riot (Acts xix.). See Diana, Temple of.

S. M. Jackson.

Diana Monkey: African monkey (*Cercopithecus diana*); so named from a white mark on the forehead which bears a

Diana monkeys.

fancied resemblance to the silver crescent of the goddess. The general color is greenish gray, the lower part of the

back chestnut, the chest and long hair on sides of face yellowish white. F. A. Lucas.

Diana, Temple of: at Ephesus: one of the Seven Wonders of the World; built at the common charge of all the Asiatic states. The chief architect was Chersiphron; and Pliny says that 220 years were employed in completing this temple, whose riches were immense. It was 425 feet long, 225 broad, and was supported by 127 columns of Parian marble 60 feet high, some of which were peculiar in this—that a belt of figure sculpture in relief surrounded the lower part of the shaft. This was, according to legend, the eighth temple built upon the site. The seventh temple had been set on fire on the night of Alexander's nativity by an obscure individual named Erostratus, who confessed on the rack that the sole motive which had prompted him to destroy so magnificent an edifice was the desire of transmitting his name to future ages (356 B. C.). The famous eighth temple was burned by the Goths in their naval invasion (A. D. 256). See J. T. Wood, *Modern Discoveries on the Site of Ancient Ephesus* (London, 1890).

Diane de Poitiers, dē̆'aan'de-pwăă'ti-ā': beautiful French lady; b. Sept. 3, 1499; married at the age of thirteen to Louis de Brézé. After his death (1531) she became a favorite of the king's son, who in 1547 ascended the throne as Henry II., and created her Duchess of Valentinois in 1548. She had great influence over the king, who permitted her to exercise royal power and control his foreign policy. She maintained her ascendency until the death of Henry in 1559. D. at Anet, Apr. 22, 1566.

Dianthus: See Pink.

Diapa'son [Gr. διὰ πασῶν, through all (the notes) the octave, i. e. ἡ διὰ πασῶν χορδῶν συμφωνία, the concord obtained by passing through all the notes of the scale; cf. ἡ διὰ πέντε, the fifth]: in music, among the ancient Greeks, the interval of an octave; the consonance obtained by going through all the strings of the lyre from first to last. In France it came to mean a tuning-fork and the pitch registered by it. The *diapason normal*, the standard of pitch generally recognized in France, gave 435 vibrations for the A above middle C. In Great Britain the name is given to the most important foundation-stops of the organ. See Organ.

Diapen'sia [from Gr. διὰ πέντε, by five]: small flowering plant, an inch or two high, with a tuft of small leathery leaves and low flower-stalk, which bears a single pentapetalous, greenish flower. It is interesting as occurring in the U. S. only on the summits of mountains in New York and New England, although common from Labrador to Arctic America and Greenland. It occurs also in Norway, Sweden, and Lapland. It probably reached the Eastern U. S. during the glacial period, and has persisted there upon the cold mountain-tops. Charles E. Bessey.

Di'aper [O. Fr. *diaspre*, jasper, a cloth of various colors (cf. Mod. Fr. *diapré*, variegated in color): Ital. *diaspro*: Span. *diaspero*, jasper < Lat. *iaspis* = Gr. ἴασπις, jasper, the precious stone]: textile fabric, such as toweling, in which a small and simple woven pattern is repeated over the whole surface. Also the decorative pattern itself when of a similar character, having one or two simple units constantly repeated, as in some wall-papers, and as often stenciled on walls. These are the more common uses of the term; originally it meant a pattern of the same general color as the ground, relieved either by being of a slightly different tint or by the run of the threads in weaving; and also the fabric itself which was so decorated. Sometimes *diaper* is distinguished from a *sprinkled* or *semé* pattern in that the latter consists of units which do not touch one another and are separated by the field or ground, while the units of the diaper continually grow out of one another, or are formed each by the other; thus a checker-board or a honeycomb is of the simplest possible diaper, whereas a plain ground with round spots is the simplest form of sprinkled pattern. In heraldry, *diaper* or *diapering* is an ornament not made up of true heraldic bearings or charges, but covering any surface, as of the field or a bearing, which is then said to be *diapered*. It is not common.

Diaphore'sis [Gr. διαφόρησις, a carrying off, perspiration (Galen); deriv. of διαφορεῖν, carry off, carry off by perspiration; διά, through + φορεῖν, carry]: the excretion of sweat from the skin without perceptible moisture; insensible perspiration. Medicines promoting this excretion are called diaphoretics, while those producing perceptible wetness of the skin are called sudorifics. But the terms diaphoretic and diaphoresis are frequently applied to both the sensible and insensible perspiration.

Diaphragm, or **Midriff** [*diaphragm* is from Gr. διάφραγμα, barrier, midriff: deriv. of διαφραγνύναι, separate by a barrier; διά, apart + φραγνύναι, fence in; *midriff* is from A.-S. *midhrif*; *midd*, middle + *hrif*, bowels, womb]: the thin musculo-aponeurotic septum which in mammals separates the abdominal cavity from the thorax. Its center in man is occupied by the cordiform tendon or trifolium (trefoil), so called from its shape, which roughly resembles a clover-leaf (Lat. *trifolium*). The diaphragm is attached to the vertebral column by two muscular buttresses or pillars called *crura* (Lat. *crus, cruris*, a leg). It is traversed by the phrenic (internal respiratory) nerves, and, like the other respiratory muscles, is partly involuntary. In forcible inspiration it is drawn down like the piston of an air-pump. It is one of the principal agents in the various expulsive acts, and also in sneezing, coughing, and laughing. Hiccough (Lat. *singultus*) is a clonic spasm of the diaphragm.

Diarbekîr, dē̆'ăăr-be-keer' (in Turkish, *Kara-Amid*): town of Asiatic Turkey; capital of a pashalic of the same name; situated on the right bank of the Tigris, near its source, and about 200 miles N. E. of Aleppo; lat. 37° 55′ N., lon. 39° 52′ E. (see map of Turkey, ref. 5–I). It is inclosed by a high, strong stone wall flanked with towers; is the seat of a Nestorian and a Jacobite patriarch, and of a Catholic and an Armenian bishop, and has numerous handsome mosques, bazaars, and khans. It was formerly a more populous city, and had extensive manufactures of silk and cotton, but these have declined. The manufacture of silk is still carried on. Pop. 40,000.

Diarrhœa [Gr. διάρροια, a flowing through, diarrhœa; διά, through + ῥεῖν, flow]: a disease characterized by frequent soft alvine discharges. The causes of diarrhœa are very numerous, and the condition must be considered as a symptom of many diseases rather than a disease itself. Intestinal irritation and inflammation, acute or chronic, are frequently the causes, and these depend on improper food and drink. The effect of improper drinking water is known to everyone. In the case of children bad milk is the common cause, and especially in summer when fermentative changes are prone to occur from the heat. In many diseases, as cholera, typhoid fever, dysentery, and consumption, diarrhœa occurs as a symptom, in consequence of the inflammation in the bowel. Diarrhœa is occasionally an expression of extreme debility, in wasting diseases like consumption, and occurs from the leaking of the watery elements of the blood into the bowels. This is akin to the profuse perspiration of similar conditions. Sometimes the diarrhœa may be salutary, and an effort on the part of nature to remove poisonous matters, as in certain cases of Bright's disease. It would not be wise to check it suddenly in such cases.

The treatment of diarrhœa requires a close consideration of its cause. If irritating substances, as improper food, have provoked it, a brisk purge like castor oil or, especially in children, aromatic tincture of rhubarb should first be given. The diet must in all cases be regulated, especially in children. Mild astringents like bismuth and prepared chalk are frequently used with good result. The more active, as iron, lead, and vegetable astringents, require more care, and opium should be given with great caution, especially to children, who bear all narcotics poorly. Change of scene, climate, and mode of life, all find their application, more particularly in chronic cases.

Revised by William Pepper.

Dias, Antonio Gonçalves: See Gonçalves Dias.

Di'astase [Gr. διάστασις, separation; διά, apart + στῆναι, stand]: a substance contained in sprouted barley, that has the power to convert starch into dextrin and maltose and dextrose. It is contained also in the leaves of most plants, and many other germinating seeds besides barley, and in the horse-chestnut. Saliva has the same power as diastase, and it is concluded, therefore, that diastase is contained in saliva. Diastase has not yet been prepared in a fine state, but in concentrated form it can be made from low-dried barley malt by grinding, treating with water, filtering by means of a press, and adding alcohol. This precipitates the diastase, which is then washed with alcohol, and afterward dried *in vacuo* over sulphuric acid. Whatever method may be employed in the preparation of diastase, the product is not a pure chemical compound. Diastase is a white solid substance, soluble in water. Its principal property is the

power to convert starch into dextrin and maltose. According to recent researches, when starch is dissolved in a solution of diastase at 63°, one-third is converted into dextrin and two-thirds into maltose. It appears probable that some forms of diastase convert starch into dextrose or glucose. The activity of diastase is greatly influenced by heat, the action stopping at 75° to 76°. The activity is destroyed by the ordinary mineral acids, as well as by oxalic, tartaric, and citric acids, and many other substances. In the preparation of beer diastase changes the starch into sugars, and this change is then followed by fermentation.

IRA REMSEN.

Diather'mancy [from Gr. διαθερμαίνειν, to warm through, deriv. of διά, through + θερμός, warm]: the property of transmitting radiant heat, the property of not transmitting radiant heat being called *adiathermancy*. When a source of radiation, such as a lamp flame or a Leslie cube, sends out energy to a thermopile or thermometer, it is found that the interposition of certain substances, as glass, ice, quartz, calcite, lampblack, vulcanite, etc., fails to impede altogether the passage of the rays. The thermopile still indicates the reception of energy from the source. Such bodies are said to be *diathermanous*. The most remarkable substance in this respect is rock salt. Melloni found a layer 2·6 mm. thick capable of transmitting 92·3 per cent. of the radiation falling upon it. An alum plate of the same thickness transmitted only 9 per cent. (*La Thermochrose*, p. 227; Naples, 1850). The modern method of studying diathermancy consists in measuring the transmitting power of the material under investigation for each wave-length of the spectrum separately. The diathermancy of various vapors, liquids, and solids have thus been determined by Ångstrom (Stockholm Acad. of Sciences, 1890, No. 7), Rubens (Wiedemann's *Annalen*, vol. xlv., p. 258), E. F. Nichols (*Physical Review*, vol. i., p. 1), and others.

So far as the wave-lengths which constitute the visible spectrum are concerned, *diathermancy* and *transparency* are synonymous.

Bodies, however, may be quite transparent and yet of low *total* diathermancy; thus alum ceases to transmit altogether wave-lengths greater than 1·4μ. Others may be opaque through failure to transmit the particular group of waves which affect the eye and may yet possess high total diathermancy, like hard rubber, which for wave-lengths greater than 0·9μ transmits radiation almost as freely as does glass.

E. L. NICHOLS.

Diath'esis [Gr. διάθεσις, arrangement, distribution, disposition, condition: διά, apart + θεῖναι, set. The word is exactly translated by Lat. *dispositio*]: in medicine, a predisposition; a constitution of body tending toward some particular disease. Writers mention the strumous, cancerous, scorbutic, rheumatic, gouty, hæmorrhagic, and other diatheses. These tendencies exercise a most powerful influence upon life and health, and their detection and treatment are matters of great practical importance.

Diatoms [from Gr. διάτομος, cut in twain; deriv. of διατέμνειν: διά, through + τέμνειν, cut]: the lower algæ comprised in the family *Diatomaceæ*, or *Bacillarieæ*. The family is represented by numerous species (about four thousand), numbering countless individuals in nearly all parts of the world. They are microscopic in size, and consist of single cells of peculiar construction. In many ways they are like the DESMIDS (*q. v.*), to which they are probably related; indeed the difference between them lies mainly in the fact that while the desmids have walls of cellulose simply, the diatoms have their walls early infiltrated with silica, making them hard and rigid. On this account provision is made for the increase of the protoplasm by the sliding of one part of the wall upon the other, as a deep box cover slides upon the sides of the box. This is accomplished by the *splitting of the wall* parallel to its surface.

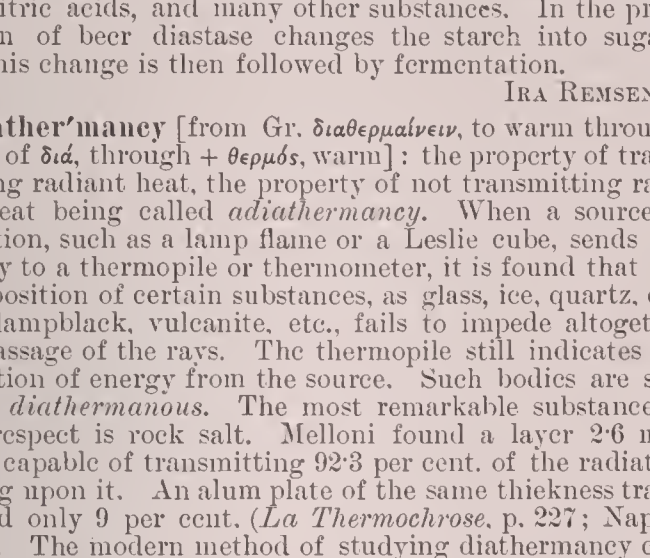


FIG. 1.—Ideal cross-sections of *Navicula*, showing the successive steps in the division of the cell. The deeply shaded portions are the "diatomin" bodies.

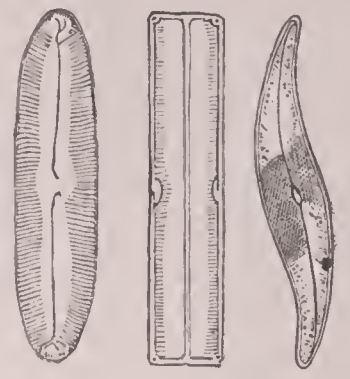


FIG. 2.—A and B, different views of *Navicula viridis*; C, *Pleurosigma angulatum*. All highly magnified.

The coloring-matter of diatoms is diatomin, which differs from chlorophyll in being yellow or brown in color; its spectrum shows some differences also, but there can be little doubt that it is functionally the same, and that chemically it differs but little from chlorophyll, of which it may be considered a marked modification. The siliceous walls constitute veritable shells, and permanently retain their shapes after the death of the cell; as a consequence, they exist in great quantities in a fossil state in the Tertiary and later beds. The walls are often marked with striæ, dots, points, etc., which have long made them objects of interest to the microscopist.

Diatoms reproduce by splitting (fission), one plant in this way giving rise to two, as shown in Fig. 1. Under certain conditions two individuals part their shells sufficiently to allow the protoplasm to escape from each one, when they unite to form a single rounded spore (zygospore), which after a time divides again into two cells, each a new (and larger) diatom. This simple sexual process appears to be for the purpose of invigorating the race, whose individuals become smaller and smaller by the splitting process (fission) described above. It appears that large individuals are produced asexually also by the escape of the protoplasm from a small plant, and this after increasing in size clothes itself with a wall again, thus assuming the proper diatom form.

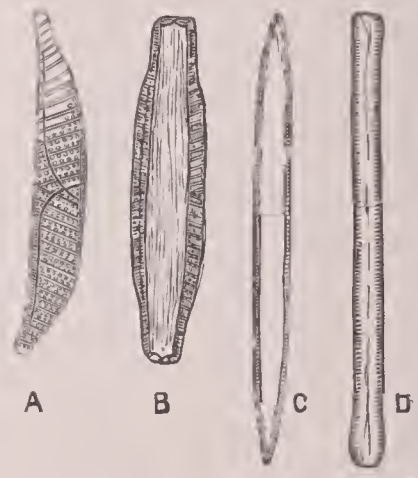


FIG. 3.—A and B, different views of the *Epithemia turgida*; C and D, different views of *Nitzschia linearis*, var. *tenuis*. All highly magnified.

While many diatoms are separate cells, many others remain attached to one another after splitting, thus forming bands or ribbons, as seen in Fig. 4, B. In some cases they secrete a mucilaginous substance upon which they rest, as upon stalks. The free species usually are actively motile and move through the water with a good deal of rapidity. Observers are not yet agreed as to the nature of the mechanism by which they move, but it is probable that it is by means of protoplasmic protrusions through the walls.

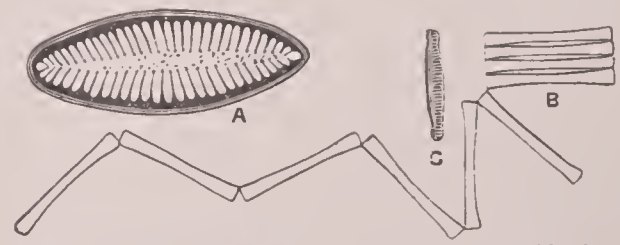


FIG. 4.—A, *Surirella elegans*; B, a number of individuals of *Diatoma vulgare*, var. *ehrenbergii*, more or less united; C, different view of a single individual. All highly magnified.

The regularity and fineness of the markings on the shells of diatoms have made them favorite objects of observation

with microscopists. These markings have been measured as follows:

Pleurosigma balticum..... ·0006 mm. (about $\frac{1}{40000}$ inch).
" *angulatum*.... ·0005 mm. (about $\frac{1}{50000}$ inch).
Amphipleura pellucida..... ·0002 mm. (about $\frac{1}{125000}$ inch).

Diatoms are classified upon the structure of their shells. Three main groups (sub-families) are recognized, viz.: I.

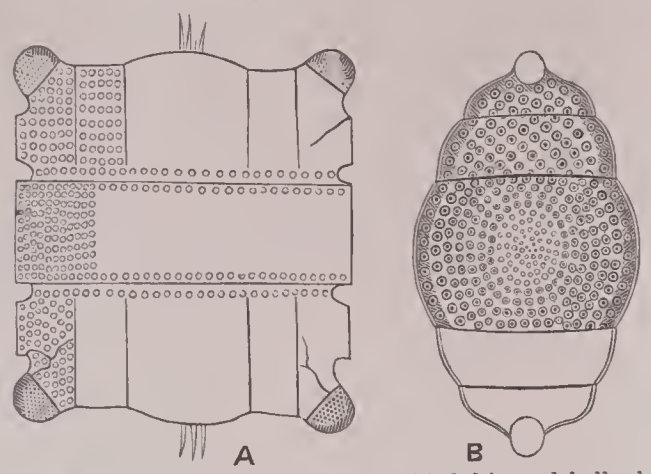


FIG. 5.—A and B, different views of *Biddulphia pulchella*, highly magnified.

Those with a distinct ridge on the principal face of the shell (*Raphidieæ*), as in *Navicula*, *Pleurosigma* (Fig. 2), *Amphipleura*, etc.; II. Those with only an indistinct or false ridge (*Pseudoraphidieæ*, as in *Epithemia*, *Nitzschia* (Fig. 3), *Surirella*, *Diatoma* (Fig. 4), etc.; III. Those with no ridge whatever (*Araphidieæ*, or *Cryptoraphidieæ*), as in *Isthmia*, *Biddulphia* (Fig. 5), *Arachnoidiscus* (Fig. 6), *Coscinodiscus*, etc.

FIG. 6.—*Arachnoidiscus ehrenbergii*, highly magnified.

In the study of the Diatoms the following works may be profitably consulted: *Sylloge Algarum*, by J. B. De Toni (vol ii., *Bacillarieæ*, 1891), contains descriptions of all known Diatoms; *Synopsis des Diatomées de Belgique*, by H. Van Heurck (1885), contains 132 excellent plates; *Diatomaceæ of North America*, by Francis Wolle (1890), contains 112 excellent plates. CHARLES E. BESSEY.

Diatonic Scale of Colors: the spaces occupied by the seven primary colors in the solar spectrum, and supposed by Newton to be exactly proportional to the length of strings that sound the seven notes in the diatonic scale of music. It is now known, however, that this theory is not well founded, although there is an analogy between the pitch of sounds and the color of bodies.

Diaz, dee'ăăz, or dee'ăăs, BARTOLOMEU: Portuguese navigator; commanded an expedition sent in 1486 to explore the western coast of Africa. He sailed or was driven by the wind around the southern extremity of Africa to the mouth of the Great Fish river. Returning homeward, he discovered the cape which he had previously doubled unawares, and called it Tormentoso, which was soon exchanged for the name of Cape of Good Hope (Cabo de Buena Esperanza). He was captain of one of the ships in the fleet of Cabral which sailed for India in 1500, and he perished by shipwreck May 29 of that year.

Diaz, PORFIRIO: Mexican general and statesman; b. in Oaxaca, Sept. 15, 1830. He studied law, but joined the army during the war with the U. S. (1847), and subsequently applied himself to military science. In 1854 he opposed Santa Anna, commanding a battalion in the army of Alvarez, and in 1858 he adhered to Juarez and the liberal party. He was elected deputy in 1861, but soon after took the field, and won a victory over the reactionist forces of Marquez. From the first he strongly opposed the French intervention; took part in the victory of Pueblo May 5, 1862, and in subsequent operations, and was captured at Pueblo May, 1863. Soon after he escaped, and during the supremacy of Maximilian he kept up the resistance in the south until forced to surrender at Oaxaca Feb., 1865. He again escaped in September, and got together a small force in the eastern provinces. After the withdrawal of the French army, recruits flocked rapidly to Diaz; he took Pueblo by assault Apr. 2, 1867, drove Marquez before him into Mexico, besieged the city, and took it June 21, 1867. In the elections of Oct., 1867, Diaz was a candidate for the presidency, but was defeated by Juarez. From that time his life was a continual struggle to overthrow Juarez and his successor, Lerdo—sometimes in congress and through the press, oftener heading revolts. Several times he was forced to take refuge in the U. S., and his adventures and escapes read like romance. In 1876 he was successful, and Lerdo was driven from the country. Gen. Mendez then became president, and was succeeded by Diaz May 5, 1877. Under his administration order was at once restored, and an era of prosperity began. By the Mexican constitution the president was not eligible to immediate re-election, and Diaz was succeeded by his friend Gen. Gonzales, in Dec., 1880. At the end of Gonzales's term (1884) Diaz was again elected, and he has since held the presidential office by successive re-elections, the constitution having been amended to permit this. Though he first reached power by irregular means, he has been decidedly the best ruler that Mexico ever had, and his wisdom and executive ability have opened a bright future for the country. He is very popular with nearly all classes in Mexico. HERBERT H. SMITH.

Diaz de la Peña, -de-lăă-pān'yăă, NARCISO VIRGILIO: landscape and figure painter; b. of Spanish parents at Bordeaux, Aug. 21, 1808; d. at Mentone, Nov. 18, 1876. He was a painter on porcelain, and began to paint pictures without instruction from a master. His figure-pieces are merely excuses for color compositions, and many of them are beautiful in color harmony. He was one of the great landscape-painters of the Fontainebleau group, and in some of his works attains to a very high level. His pictures of the forest of Fontainebleau are those which have made his reputation. He received a first-class medal at the Salon of 1848 and the Legion of Honor in 1851. His pictures are numerous but are often counterfeited. Several are in the Louvre. A fine example of his work is *The Storm*, in the collection of W. T. Walters, Baltimore. W. A. C.

Diaz del Castillo, BERNAL: Spanish soldier and author; b. at Medina del Campo, Valladolid, about 1498. He went to Darien with Pedrarias in 1514 as a common soldier; soon after drifted to Cuba; was with Francisco Hernandez de Córdoba in 1517, when Yucatan was discovered; and with Grijalva during the exploration of the Mexican coasts, 1518. On his return he enlisted with Cortés (1519), and served through the subsequent campaigns and in the siege of Mexico, never rising above subaltern offices. He then marched with Alvarado to Guatemala, where he received an *encomienda* of Indians; was one of the first settlers of Santiago de los Caballeros, and *regidor* of that town. In 1668 he began to write his *Corónica de la Conquista de Nueva España*, a narrative of the events in which he had taken part. It was intended as a refutation of Gomara's history, but it remained unpublished until long after his death, which occurred about 1593. It was first published at Madrid in 1632, and there are later editions, the best being that in the *Biblioteca de Autores Españoles*, vol. xxvi. The *Corónica* is a simple soldier's narrative, embodied in rough language, but full of information and having the impress of truthfulness. It is perhaps the best original authority for the history of the conquest of Mexico. HERBERT H. SMITH.

Diaz de Solis, JUAN: See SOLIS.

Dib'din, CHARLES: musician and writer of songs; b. at Southampton, England, Mar. 15, 1745. He composed over 1,000 sea-songs, among them *Tom Bowling* and other favorites of the British tar. D. July 25, 1814.—His son, THOMAS JOHN DIBDIN, b. in 1771, was an actor and author of innumerable melodramas, farces, etc., of which the best known is *The Cabinet*. D. Sept. 16, 1841.—Another son, CHARLES DIBDIN (1768–1833), wrote songs and dramas.

Dibdin, THOMAS FROGNALL, D. D.: English bibliographer; b. in Calcutta in 1776; a nephew of Charles Dibdin, the writer of sea-songs; took orders as a priest in 1804; published, besides other works, *Bibliomania* (1809); a new edition of Ames's *Typographical Antiquities of Great Britain* (4 vols., 1810–19); *Bibliographical Decameron, or Ten Days' Pleasant Discourse over Illuminated MSS.* (1817); and *Reminiscences of a Literary Life* (2 vols., 1836). D. Nov. 18, 1847.

Dibranchia'ta [from Gr. δι-, twice + βράγχια, gills]: an order of *Cephalopoda*, or cuttlefishes; characterized by having two gills in the mantle cavity. See Cephalopoda and Octopoda.

Dicaear'chus (in Gr. Δικαίαρχος): Greek philosopher and author; disciple of Aristotle. History and geography were his chief studies; his great work, the *Life of Greece* (βίος Ἑλλάδος), or rather *Life of the Greek People*. Dicaearchus is the source of many of the extant Greek biographies. The scant fragments of his writings may be found in Müller's *Fragmenta Historicorum Græcorum*, vol. ii., pp. 225–268, and *Geographi Græci Minores*, vol. i., pp. 97–110.

B. L. Gildersleeve.

Dicæ'um [so named by Cuvier, perhaps from Gr. δίκαιος, just]: a genus of birds belonging to the family *Nectariniдæ*, remarkable for their beauty, their rapid flight, and the sweetness of their long-continued though very soft notes. They are of small size, usually have a slender arched bill, short tarsi, and red conspicuous in the plumage. They inhabit the highest trees, and weave a purse-shaped nest from the down found about the seeds of many plants. Among the best-known species are the Australian dicæum (*Dicæum hirundinaceum*, and the *Dicæum cruentatum* of India.

Australian dicæum.

Di'cast [from Gr. δικαστής, juror, judge, deriv. of δίκη, justice]: a member of a body of Athenian citizens, consisting of 6,000, who were chosen yearly by lot from the body of freemen for the purpose of assisting in the administration of justice. They were divided into ten sections, generally about 500 each, before which causes were tried. The leading points of law and evidence were previously ascertained before a magistrate, and the conflicting issues were reduced to a formal statement called the anakrisis. This was carried for decision before a section of the dicasts, who were supreme judges of the law and the fact. They were kept in ignorance of the cause which was to come before them, and each dicast was sworn to vote according to the law and justice. The analogies of the system to jury trial are obvious, as are also the differences between the two systems.

The word *dicasterion* was used to denote the whole body of the dicasts and the place where their session was held.

Dice, plur. of *die* [the sing. is reconstructed from **dee*, under influence of plur.; O. Fr. *de*, *det*: Ital. *dado* < Lat. *datum*, what is given, hence the result of the throw, the throw, the die itself]: small cubes used in playing certain games of chance. They are made of bone, ivory, or close-grained wood, having their six sides marked with dots or pips, from one up to six. These dots are so arranged that the numbers on two opposite sides taken together always count seven. The dice are shaken in a box called a dice-box, and then thrown on a board or table, and the number of dots on the upper faces decide the game. The invention of dice is very ancient, and is variously ascribed to the Greeks and Egyptians, and by Herodotus to the Lydians. Dice similar to those of our day have been found in Thebes. The Greeks gave the names of their gods and heroes to the different throws. The game of dice was popular among the Romans, and it is said that during the decline of the empire wealthy Romans not unfrequently staked their whole fortunes on a single throw. Gamblers resort to the practice of loading dice by adding lead to them on one side, so that the higher numbers are almost sure to turn up. When this trick is suspected, the thrower should turn down the mouth of the box abruptly, and this will prevent the dice from arranging themselves unjustly. Two cubes, supposed to be Etruscan dice, but marked with words instead of pips, have given ground for Taylor's theory that the Etruscan was a Turanian language, the words being assumed as numerals.

Dicen'tra [from Gr. δίκεντρος, double-spurred; δι-, two + κέντρον, sting, spur; so named in allusion to the shape of the blossom]: a genus of herbaceous perennials belonging to the family *Fumariaceæ*. They are found in moist, rich woodlands, and flower in spring. Among the species native in the U. S. are *Dicentra cucullaria* (commonly called Dutchman's breeches), *Dicentra canadensis* (squirrel corn), and *Dicentra eximia*. *Dicentra chrysantha*, found in California, has large golden-yellow flowers. *Dicentra spectabilis*, introduced from Japan about 1846, grows sometimes to the height of 3 feet, and produces long racemes of rosy blossoms.

Dicey, Albert Venn: See the Appendix.

Dicey, Edward, C. B.: journalist; b. in Leicestershire, England, in May, 1832; educated at Cambridge; became a frequent contributor to the leading periodicals, and after serving on the staff of the *Daily Telegraph*, acted as the special correspondent for that paper in different parts of the Continent. He was for three months editor of the *Daily News* in 1870, and then became the editor of the *Observer*, remaining in the latter position till 1889. Besides his newspaper and magazine articles, he has written *A Memoir of Cavour*; *Rome in 1860*; *The Schleswig-Holstein War*; *The Battle-fields of 1866*; *The Morning Land*; and *Victor Emmanuel* in the New Plutarch Series (1882).

Dichlamyd'eous [from Gr. δι-, two + χλαμύς, cloak]: in botany, having both calyx and corolla. Thus butterenps, roses, beans, etc., are dichlamydeous, while anemones, buckwheat, etc., are monochlamydeous.

Dichotomy: an artificial system for the arrangement of natural objects, based upon principles of binary distinction. In logic, the division of a class into two sub-classes, which are opposed to each other by contradiction. In anthropology, the recognition of two factors, and only two, in man—the physical and the spiritual—contrasted with trichotomy, which recognizes in man three factors—viz., body, soul, and spirit.

Di'chroism [from Gr. δίχροος, two-colored; δι-, two + χροιά, color]: the property possessed by some crystallized bodies of showing two different colors, according to the direction in which rays of light pass through them. The crystals of the double chloride of palladium and potassium, for example, appear deep red along the axis, and vivid green in a transverse direction. Dichroism in physiological opties is a term frequently applied to color-blindness, because the Daltonist or color-blind individual possesses a system of colors based upon only two of the three primaries of the "trichroic" or normal eye. See Color-blindness.

Di'chroite, Cordierite, or **Iolite**: a silicate of magnesia, ferric oxide, and alumina. It is found in prisms belonging to the trimetric system, and is sometimes used as a gem.

Dichromatism [from Gr. δι-, twice + χρῶμα, color]: in ornithology, a color variation found in some birds, a given species exhibiting two distinct phases of coloration not due to sex, nor to changes produced by age or season. One of the best examples of this is shown by the little screech owl (*Megascops asio*), which may be either gray or red, young of each color being found in the same nest. The little blue heron (*Ardea cærulea*) also exhibits dichromatism, and may be either blue or white.

F. A. Lucas.

Dick, Thomas, LL. D.: Scottish author; b. in the Hilltown, Dundee, Nov. 28, 1774; was educated for the ministry in connection with the Secession Church in the University of Edinburgh 1794–1801, but after preaching a while as a licentiate he became a teacher, and had schools at Methven and at Perth. The success of his first book, *The Christian Philosopher* (Glasgow, 1823; 8th ed. 1842), induced him to give up teaching in 1827, and devote himself to literature. He lived at Broughty Ferry, near Dundee, and wrote numerous popular scientific and religious works, among which are *The Philosophy of Religion* (1825); *The Philosophy of a Future State* (1828); *Celestial Scenery* (1838); and the *Sidereal Heavens* (1840). He received a pension from the Government (1847). D. at Broughty Ferry, July 29, 1857. In the *Christian Philosopher* he aimed, as he said, "to illustrate the harmony which subsists between the system of nature and the system of revelation, and to show that the manifestations of God in the material universe ought to be blended with our view of the facts and doctrines recorded in the volume of inspiration." His above-mentioned later works were all supplementary in aim to the *Christian Philosopher*.

Dickens, Charles: novelist; b. at Landport, Portsmouth, England, Feb. 7, 1812. His father was John Dickens, who held a position in the navy pay department, and who afterward became parliamentary reporter for one of the London daily papers. After studying in a college near Rochester, young Dickens was placed in an attorney's office to learn the profession of the law. This pursuit proving

uncongenial to his taste, he left it and obtained a position as reporter on the staff of the *Morning Chronicle*. In this paper appeared the first efforts of his genius, his *Sketches of Life and Character*, which in 1836 were collected and published in two volumes under the title *Sketches by Boz*. The public gave these a favorable reception, and in 1837 they were followed by *The Posthumous Papers of the Pickwick Club*, which first appeared as a serial in monthly parts. The work had an immediate and almost unparalleled success, and raised its author at once to the first rank among the popular writers of the day. In its peculiar vein of humor it has never been equaled in English literature. He was married in 1838 to the daughter of George Hogarth, a music critic, and in the same year appeared *Oliver Twist*, a novel in three volumes. This was followed by *The Life and Adventures of Nicholas Nickleby* (3 vols., 1839); *Master Humphrey's Clock* (1840–41); and *Barnaby Rudge* (1841). In 1841 he visited the U. S., and in the following year appeared his *American Notes for General Circulation*, in which life and character in the U. S. were somewhat severely satirized. The *Notes* were followed in 1843–44 by the *Life and Adventures of Martin Chuzzlewit* (3 vols.), a work which reflected still more on the faults and foibles of the people of the U. S.

In 1844 Mr. Dickens went to Italy, whence he returned in 1845, and toward the end of that year he assumed the chief editorship of the *Daily News*, a Liberal journal then just established. He soon, however, resigned this position. In 1847–48 appeared his *Dombey and Son*, which, in some of its passages at least, is not surpassed by any of his works either in power or pathos. It was followed in 1850 by *The Personal History of David Copperfield*, which is regarded by many as the best of all his novels. Certainly in none other is the interest more intense or better sustained from the beginning to the end. It is commonly understood that in the story of *David Copperfield* the novelist has introduced many of the incidents or circumstances of his own life, without, however, following so closely the real history as in any way to compromise the characters of those with whom he associated. Among his other works may be mentioned *Bleak House* (1852); *Hard Times* (1854); *Little Dorrit* (1857); *A Tale of Two Cities* (1860); *Great Expectations* (1862); *Our Mutual Friend* (1864–65); and *The Mystery of Edwin Drood*, left unfinished at his death. *Household Words*, a weekly periodical originated by him in 1850, had a very extensive circulation. He afterward in 1859 started another weekly journal entitled *All the Year Round*. In 1867 he made a second visit to the U. S., and met everywhere with a cordial and even enthusiastic reception. He gave in the principal cities public readings from his own works, which were attended by crowded audiences. He returned to his native country in the spring of 1868, and died at Gad's Hill, June 9, 1870. He was buried in Westminster Abbey June 14, 1870. See his *Life* by John Forster (3 vols. 8vo, 1871–72–74), and Kent's *Charles Dickens as a Reader*; also Miss Kate Field's *Pen Photographs of Charles Dickens's Readings in America*.

Dickey, Charles Andrews, D. D.: Presbyterian preacher and pastor; b. in Wheeling, West Va., Dec. 25, 1838; educated at Washington and Jefferson College (1858). He was pastor of the United Presbyterian church of Allegheny City, Pa., 1861–69, of the First Presbyterian church of St. Louis 1869–75, and of the Calvary Presbyterian church, Philadelphia, from 1875–93, when he resigned that he might devote his time to the service of the Presbyterian Hospital, Philadelphia, of which institution he has been president since 1883.

Willis J. Beecher.

Dickins, John: Methodist Episcopal preacher; b. in London, Aug. 24, 1747; studied at Eton; and emigrated to America before the Revolutionary war. In 1774 he became a Methodist, and soon began to preach. He was one of the ablest preachers of his day, and contributed much to the foundation of Cokesbury College, near Abingdon, Md., and the Methodist Book Concern. Died of yellow fever in Philadelphia, Pa., Sept. 27, 1798.

Dickinson: town (founded in 1882); Stark co., N. Dak. (for location of county, see map of North Dakota, ref. 3–C); situated on Heart river, and on N. Pac. R. R.; 109 miles W. of the Missouri river; has churches of six denominations, good public school, headquarters of the Mission Division on N. P. R. R., cigar-manufactory, brick-works, and other minor industries. Pop. (1890) 897; (1900) 2,076.

Editor of "Press."

Dickinson, Anna Elizabeth: orator; b. of Quaker parents at Philadelphia, Oct. 28, 1842; was educated in the Friends' free schools. Her first public speech was delivered in Jan., 1860, at a meeting for the discussion of woman's rights, and at once established her reputation. During the civil war she delivered many patriotic and political addresses, and subsequently spoke much upon labor reform, woman's suffrage, etc. In 1875 she entered upon the dramatic profession and produced two plays, *Marie Tudor* and *Anne Boleyn*, in both of which she performed the principal part.

Dickinson, Daniel Stevens, LL. D.: Senator and lawyer; b. in Goshen, Conn., Sept. 11, 1800. He was elected as a Democrat to the Senate of New York in 1836, and became Lieutenant-Governor of that State in 1842. In 1844 he was chosen a Senator of the U. S. for six years. He was distinguished as a debater, and was the leader of the conservative (Hunker) Democrats of New York. After he retired from the Senate he practiced law at Binghamton with success. In 1861 he was elected attorney-general of New York. During the civil war he zealously supported the cause of the Union by public speeches. He was appointed district attorney for the southern district of New York in the spring of 1865. D. in New York city, Apr. 12, 1866. See his *Life and Works* by his brother (2 vols., New York, 1867).

Dickinson, Don M.: lawyer; b. at Port Ontario, N. Y., in 1845, but was taken when a child to Detroit, Mich., where he has since resided; studied law at Michigan University, and began practice in Detroit; was Postmaster-General Jan. 16, 1888, to Mar. 5, 1889.

Dickinson, John, LL. D.: lawyer and statesman; b. in Maryland, Nov. 13, 1732. He received his legal education in London; practiced law with success in Philadelphia, and was a deputy to the first Colonial Congress in 1765. He was a member of the Continental Congress in 1774, and wrote for that body several important state papers, among which was a *Declaration to the Armies*. He was an eloquent and ready debater. In 1776 he spoke against the Declaration of Independence, which he regarded as premature, and he was one of the few members of Congress who did not sign that declaration. He consequently became unpopular, and was defeated in the next election, but he served as a private soldier in the war of Independence. In 1779 he represented Delaware in Congress. He was president of Pennsylvania in 1782–85. He wrote numerous political essays, and had a high reputation for learning. In 1783 he founded and endowed Dickinson College at Carlisle, Pa. D. in Wilmington, Del., Feb. 14, 1808.

Dickinson, Jonathan: Presbyterian theologian; b. at Hatfield, Mass., Apr. 22, 1688; graduated at Yale College in 1706. He preached at Elizabethtown, N. J., from 1709 till his death; became president of the College of New Jersey 1746. He wrote several works on theology. D. in Elizabethtown, N. J., Oct. 7, 1747. His collected writings were published in Edinburgh 1793.

Dickinson College: an institution of learning, situated in Carlisle, Pa. It was founded in 1783, and with the exception of the University of Pennsylvania is the oldest college in the State. In consequence of the valuable gifts and personal interest of Hon. John Dickinson, "president of Pennsylvania," the institution received his name. The first president was Charles Nisbet, D. D., a native of Scotland and minister at Montrose. Later presidents have been Robert Davidson, D. D., elected in 1804; Jeremiah Atwater, D. D., in 1809; John M. Mason, D. D., in 1821; William Neill, D. D., in 1824; Samuel B. How, in 1830; John P. Durbin, D. D., in 1833; Robert Emory, D. D., in 1845; Jesse T. Peck, D. D., in 1848; Charles Collins, D. D., in 1852; Herman M. Johnson, D. D., in 1860; Robert L. Dashiell, D. D., in 1868; James A. McCauley, D. D., LL.D., in 1872; George E. Reed, D. D., in 1889.

The institution is denominational. Until 1833 it was under Presbyterian control, but the division of that Church into the old and new branches brought the college under grave embarrassments. The Old School kept the educational funds; the New School had a majority of the board of trustees, but, being without funds, transferred the college to the Methodist denomination, under whose care it now remains. At the breaking out of the civil war (1861) it had many students from the Southern States; these left, others were called to the battle-field, and the college suf-

fered in its finances until the year of the centenary of Methodism, when its endowment fund was increased $100,000. Since 1882 the endowment has been increased by about $120,000, and buildings and other equipment added at a cost of about $125,000. The new buildings are the Jacob Tome Scientific Building, James W. Bosler Memorial Library Building, and a gymnasium, making six buildings in all. The library contains about 45,000 volumes.

There are three courses of study—(1) the classical course, (2) the Latin-scientific course, and (3) the modern language course. Greek is omitted from the Latin-scientific course, and Greek and Latin from the modern language course. JAMES A. MCCAULEY.

Dickson, Sir COLLINGWOOD: soldier; b. 1817; entered the Royal Artillery as second lieutenant in 1835; became captain in 1846 and colonel in 1866; served during the Eastern campaign of 1854–55 on the staff of Lord Raglan, and was present at the actions of Bulganac and McKenzie's Farm, battles of Alma and Inkerman, capture of Balaklava, expedition to Kertch, and siege of Sebastopol; wounded Feb. 4, 1855; commanded the right siege-train, and was present at the bombardment, gaining the Victoria Cross for gallantry Oct. 17; was breveted lieutenant-colonel and colonel; received medal with four clasps from his own Government, also the Turkish medal, and was appointed aide-de-camp to the Queen, officer of the Legion of Honor, and created a C. B. He is also a knight of the order of Charles III. and of Isabella the Catholic. In 1870 he was appointed inspector-general of artillery, and in 1871 nominated a K. C. B. In 1875 he was made a colonel-commandant of the ninth brigade of Royal Artillery; general 1877.

Dickson, SAMUEL HENRY, M. D., LL. D.: physician; b. of Scottish parentage at Charleston, S. C., Sept. 20, 1798; graduated at Yale in 1814, and received the degree of M. D. at the University of Pennsylvania in 1819. In 1824 he became Professor of the Institutes and Practice of Medicine at Charleston Medical School (S. C.); was Professor of Practice in the University of New York 1847–50, returning then to Charleston. In 1858 he was called to the chair of practice at Jefferson College, Philadelphia. He was the author of *Manual of Pathology and Practice of Medicine*; *Essays on Pathology and Therapeutics*; *Essays on Life, Sleep, Pain, etc.*; *Elements of Medicine*; and numerous pamphlets upon medicine and other subjects. D. in Philadelphia, Pa., Mar. 31, 1872.

Dickson, WILLIAM PURDIE, D. D., LL. D.: Scottish educator and biblical scholar; b. at Pettinain manse, Lanarkshire, Oct. 22, 1823: graduated at the University of St. Andrews 1851. He was minister of Cameron parish, Fife, 1851–63; Professor of Biblical Criticism, University of Glasgow, 1863–73; and from 1873, Professor of Systematic Theology in that university. Under his care as curator the university library has become celebrated for the completeness of its catalogues. He has been a large contributor to books of reference and periodicals. He published a translation of Mommsen's *History of Rome* (4 vols., London, 1862–66; revised ed. 1868; two supplemental volumes, 1887) and a translation of Meyer's *Commentary on the New Testament* (Edinburgh, 1873–80). WILLIS J. BEECHER.

Diclinic System: See CRYSTALLOGRAPHY.

Dicotyle'dons [from Gr. *δι-*, two + *cotyledon*, a seed leaf, a cavity]: a sub-class of higher flowering plants (Angiosperms); characterized by having their first leaves (cotyledons) in pairs, the veins of the later leaves mostly netted, the parts of their flowers commonly in fives, and the woody bundles of their stems arranged concentrically. There are exceptions to every one of the foregoing characters, and it is only by the general agreement of the characters that the sub-class is defined.

Here are included all the trees of northern climates, as well as the greater part of the shrubs and herbs. In woody plants the stems of dicotyledons are easily distinguished from those of the other sub-class (monocotyledons) by having distinct pith, wood, and bark, but this does not serve to separate them from those of the Conifers among the Gymnosperms. In fact the resemblance of the stems of dicotyledons to those of the Conifers led the older botanists to include all Gymnosperms in the dicotyledons, ignoring the profound differences in the ovule, and ovuliferous leaves. The real relation of these groups to one another is more as follows:

ANTHOPHYTA, or PHANEROGAMIA.	Class II. Angiosperms.	Sub-class II. Dicotyledons.
		Sub-class I. Monocotyledons.
	Class I. Gymnosperms.	

The dicotyledons include many orders and a great many families. CHARLES E. BESSEY.

Dictamnus: See DITTANY.

Dicta'tor [Lat., commander, dictator, deriv. of *dicta're*, command]: a magistrate of ancient Rome who was invested with extraordinary authority. He was elected in cases of especial danger to the republic and retained his office for six months, but might be elected again if the state still stood in need of his services. The senate decided when it was necessary to elect a dictator, and made over to one of the consuls the power of nominating a man to the office. The first dictator was chosen during the war with the Latins, 500 B. C. In the exercise of his authority he recognized no superior. He could raise and disband forces; he could proclaim war, and could inflict such punishments as he pleased. During his rule all other magistrates except the tribunes of the people were suspended from their duties. He was preceded by twenty-four lictors with the fasces. When elected he chose a subordinate called *magister equitum*, who at first a mere transmitter of orders, after the second Punic war had almost as much power as the dictator. But the dictator's authority was limited in several ways. He could not pass the borders of Italy; he could not touch the treasury, neither could he ride on horseback on any expedition. The office at first was confined to patricians, and held in great honor, but afterward became odious on account of the usurpations of Sulla and Julius Cæsar, so that on the death of the latter the senate, on the motion of Antony, decreed that no more dictators should be appointed. The last regular dictator held office 202 B. C.

Dictionary: a book whose distinguishing characteristic is the arrangement of its subjects according to some stated principle connected with the form of their names, usually the principle of alphabetic order. In its original and proper use the term was limited to books in which the subjects treated were words or names, but it is now, by restriction of the characteristic to alphabetic arrangement, freely extended to books treating of other subjects. Thus we have dictionaries of biography, antiquities, politics, history, history of special countries, geography, statistics, heraldry, medicine, natural history, philosophy, arts and manufactures, quotations, conversation, the Bible, etc. There are dictionaries of things (Germ. *Realwörterbücher*) as distinguished from word-books or dictionaries proper. The dictionary of things which undertakes to cover all fields of knowledge is called an encyclopædia or cyclopædia. As dictionaries of things will be duly treated under the special topics with which they are connected, the present article restricts itself to the term dictionary in its original and purely linguistic sense.

There are a number of terms partly synonymous with *dictionary*, at least in current usage, and partly indicative of subordinate classifications, which deserve notice in this connection. *Lexicon* is a term most commonly applied to dictionaries of Greek, Latin, and Hebrew, but may be applied to any dictionary of a dead or foreign language. *Thesaurus* (Gr. θησαυρός, treasury) is a term which is sometimes used for the more extensive lexical works involving copious citations and discussions. *Vocabulary* refers in its common use to a word-list with concise definitions accompanying a special text or extract. Thus a *Vocabulary to the First Six Books of the Iliad*. A *glossary* is properly a collection of rare, obscure, dialectal, or antiquated words with no attempt at completeness in any line. *Idioticon* (Gr. ἰδιωτικός, deriv. of ἴδιος, peculiar to one's self) applies to a collection of the words of a single dialect. *Onomasticon* (Gr. ὀνομαστικόν (*sc.* βιβλίον), deriv. of ὄνομα, name) is a collection of names or of the technical terms of a science or art. The classical example is the *Onomasticon* of Julius Pollux (second century A. D.), in which the words of the Greek language are arranged in groups according to their meaning; thus under such headings as the house, parts of the house, doors, locks, ships, nautical terms, parts of the day, etc.

Closely related to the dictionary or word-book is the *concordance*, which arranges the material of an important work or set of works in passages or phrases, classifying them according to prominent words or catch-words, and indicating the book, chapter, verse, or line of their occurrence. Or it may be viewed as an index-list of the prominent words accompanied by the passages in which they occur. Examples are Cruden, A., *A Complete Concordance to the Holy Scriptures*; Bruder, K. H., *Concordantiae omnium vocum Novi Testamenti Græci primum ab E. Schmidt editæ*; Clarke, Mrs. Cowden, *Complete Concordance to Shakespeare*;

Prendergast, G. L., *Concordance to the Iliad of Homer*; Dunbar, H., *Concordance to the Odyssey and Hymns of Homer.*

A list of the words or word-forms in an author or work alphabetically arranged with reference to the passages where they occur is called an *index.* Thus Seber, W., *Iudex vocabulorum in Homeri Iliade atque Odyssea*; Gehring. *Index Homericus*; Whitney, W. D., *Index Verborum to the Publ. Texts of the Atharva-Veda.*

Gazetteer is a name frequently applied to dictionaries of place-names, i. e. geographical dictionaries. This title is said to have had its origin in the name of an early work of the kind, Echard's, *The Gazetteer's or Newsman's Interpreter.* Examples are Lippincott's *Gazetteer of the World, a Complete Pronouncing Gazetteer or Geographical Dictionary*; De Colange, L., *The National Gazetteer, a Geographical Dictionary of the United States.*

Following is a list of dictionaries, selected and arranged, not on an historical, but on a purely practical, basis, as being the most important for general use in connection with the English language, the historical development of the English dictionary being reserved for the article LEXICOGRAPHY (*q. v.*):

Dictionaries of the English Language in English.—A New English Dictionary on Historical Principles, founded mainly on the materials collected by the Philological Society, edited by James A. H. Murray (Oxford, 1888). The letters A, B, and the greater part of C and E had appeared in Jan., 1893. The aim of this work is "to furnish an adequate account of the meaning, origin, and history of English words now in general use, or known to have been in use at any time during the last 700 years." It gives an account of the various forms in which each word appears since the formation of the language in the eleventh century, or since the introduction of the word into the language, and is consequently invaluable for the history of orthography. It discusses these varieties of form in the interest of determining the historical development of their pronunciation. It attempts to arrange all the meanings known to have been attached to each word in the order of their development, and to account for this development. It furthermore seeks to give by application of the comparative method the prehistoric etymology of the word. Its purpose is not to dictate to usage, but to record usage. It promises to be as valuable a classified word-inventory as has ever been made for any language.

The Century Dictionary, an Encyclopædic Lexicon of the English Language, prepared under the superintendence of William Dwight Whitney (6 vols., New York, 1891), addresses itself more directly to the demands of general use than Murray's *Dictionary.* It is far less pretentious in its aims, and is naturally less exhaustive in its treatment of the history of form and meaning, being based upon far smaller collections of material. Its etymologies are generally brief. Free use of excellent illustrations and much explanation of *things* as additional to that of *words* proper cause it to share some of the characteristics of an encyclopædia. Its vocabulary includes more than 200,000 words.

The Imperial Dictionary of the English Language, a Complete Encyclopædic Lexicon, Literary, Scientific, and Technological, by John Ogilvie; new edit. by Charles Annandale (London, 1883). This is the prototype of the *Century Dictionary*, which has followed its general plan and is based to some extent upon its material.

A Standard Dictionary of the English Language, upon Original Plans, prepared under the supervision of Isaac K. Funk, editor-in-chief, and Francis A. March, advisory editor (New York, 1893–95). For this work is claimed the largest vocabulary in any completed dictionary. As it is compressed into one volume (2,318 pages), its treatment of words is very concise. It contains all possible special vocabularies, and is supplemented by an atlas of the world and a condensed cyclopædia. A peculiar and very useful feature is a list of disputed spellings and pronunciations, showing plainly the preferences of eminent specialists.

Webster's International Dictionary of the English Language, being the Authentic Edition of Webster's Unabridged Dictionary, Revised under Supervision of Noah Porter (Springfield, Oct., 1890). This work also includes many special vocabularies—proper names of all kinds, phrases and proverbs from foreign languages, etc.

A Dictionary of the English Language by Rev. James Stormouth, the Pronunciation Revised by Rev. P. H. Phelp (New York, 1885). A dictionary based essentially upon the standard English of England, and as such a particularly valuable book of reference, especially in the matter of pronunciation. It does not seek to present an inventory so much as a norm of usage. A peculiar feature of the book is the arrangement of the word-material in groups according to derivation, or sometimes according to etymology; thus in one group under *music*: *musical*, *musically*, *musicalness*, *musician*, *music-glasses*, etc.

A New Dictionary of the English Language by Ch. Richardson (2 vols., London, 1839). Valuable for its numerous quotations from standard authors, chronologically arranged. Its etymologies are remarkable for their perversity. A new and greatly condensed edition, omitting the useful citations and retaining the baneful etymologies, appeared in 1860.

A Dictionary of the English Language, Founded on that of Dr. Samuel Johnson, with Numerous Additions and Emendations, by R. G. Latham (4 vols., London, 1866); an unsuccessful attempt to adapt the famous dictionary of Dr. Johnson, which first appeared in 1755, to present needs.

A Dictionary of the English Language, by Joseph Emerson Worcester (Boston, 1860, and in many other subsequent editions).

Schmidt's *Shakespeare Lexicon, a Complete Dictionary of all the English Words, Phrases, and Constructions in the Works of the Poet* (2 vols., 1874–75), may be mentioned as a sample of the dictionaries devoted to the explanation of the meanings of words as used by particular authors.

Etymological Dictionaries of English.—Skeat, W. W., *An Etymological Dictionary of the English Language Arranged on an Historical Basis* (Oxford, 1882; 2d edit. 1884; abbrev. of same, *A Concise Etymological Dictionary*, 2d edit. 1885). The best work of its kind, but very defective on the side of scientific phonology. This is particularly noticeable in the treatment of the loan element of the language and in the field of general Indo-European philology.

Mueller, Eduard, *Etymologisches Wörterbuch der englischen Sprache* (2d edit. 2 vols., Cöthen, 1878). Represents the best philological attainment of the date of publication. Needs revision.

Wedgewood, H., *A Dictionary of English Etymology* (2d edit. 1872). Though containing much original and valuable material, its uncritical method and fantastic views of the growth of language render it entirely untrustworthy.

Palmer, A. S., *Folk-etymology, a dictionary of verbal corruptions or words perverted in form or meaning by false derivation or mistaken analogy* (London, 1882). A most valuable and useful collection of material, needing, however, a more critical treatment.

The Stanford Dictionary of Anglicized Words and Phrases, edited by C. A. M. Fennell (1892). This work deals principally with the material imported into English from other languages since the introduction of printing.

Dictionaries of Phrases and Synonyms.—Roget's *Thesaurus of English Words and Phrases, classified and arranged so as to facilitate the expression of ideas and assist in literary composition* (London, 1852, 1879, 1886, 1892). A classified vocabulary of standard English, with a valuable collection of phrases and proverbial expressions.

Smith, Charles John, *Synonyms Discriminated, a dictionary of synonymous words in the English Language, illustrated with quotations from standard writers* (new edition 1882).

Crabb, G., *English Synonyms Explained* (latest edition 1889).

Dictionaries of Quotations, Literary Allusions, Pseudonyms, etc.—Bartlett, J. R., *Familiar Quotations* (1889); Brewer, E. C., *Dictionary of Phrase and Fable* (1880); *The Reader's Handbook* (1888); Wheeler, W. A., *Noted Names in Fiction* (1889); *Familiar Allusions* (1882); Allibone, S. A., *Great Authors of All Ages* (1885); *Dictionary of Authors* (5 vols., 1872–91); Ward, A. L., *Dictionary of Quotations in Prose* (1889); Bent, S. A., *Short Sayings of Great Men* (1882); Frey, A. R., *Sobriquets and Nicknames* (1888); Reddall, H. F., *Fact, Fancy, and Fable* (1889); Barbier, A. A., *Dictionnaire des Ouvrages Anonymes* (4 vols., 1880); Weller, E., *Lexicon Pseudonymorum* (1886); Halkett-Laing, *Dictionary of Anonymous and Pseudonymous Literature of Great Britain* (4 vols., 1888); Cushing, W., *Initials and Pseudonyms* (1885; second series 1888); Cushing, W., *Anonyms* (1890); Franklin, A., *Dictionnaire des Noms, Surnoms, et Pseudonyms Latins de l'Histoire Littéraire du Moyen Âge* (1875); Adams, W. D., *Dictionary of English Literature*: includes in its headings names of authors and *noms de plume*, titles of books, first lines of familiar poems, phrases, etc.

Dictionaries of Names of Persons and Places.—Lippincott's *Gazetteer of the World*, edited by Thomas and Baldwin (1882); Johnston, A. K., *General Dictionary of Geography* (1882); Putnam's *Globe Pronouncing Gazetteer of the World* (1888); Blackie, C., *Dictionary of Place-names, giving their derivations* (1887); *Century Cyclopædia of Names* (1894); Kleinpaul, R., *Menschen- und Völkernamen* (1885); Joyce, P. W., *Irish Names and Places*, 2 series (1883); Lower, M. A., *English Surnames* (2 vols., 1875); *Patronymica Britannica, dictionary of family names* (1860); cf. also Yonge, C. M., *History of Christian Names* (1884).

Dictionaries of English Dialects, etc.—Wright, Thomas, *Dictionary of Obsolete and Provincial English*, containing words from the English writers previous to the nineteenth century which are no longer in use, or are not used in the same sense, and words which are now used only in the provincial dialects (2 vols., 1857; later edition by S. J. Herrtage, 1886); Halliwell-Phillips, J. O., *Dictionary of Archaic and Provincial Words, Phrases, etc.* (2 vols., latest edition 1889).

Britten and Holland, *Dictionary of English Plant Names* (3 parts, 1878–84); Bartlett, J. R., *Dictionary of Americanisms* (1877); Farmer, J. S., *Americanisms, Old and New* (1889).

For special dictionaries to various local dialects of England, see bibliography by J. Wright in Paul's *Grundriss der germ. Philol.* i., 976 ff.

Dictionaries of Middle English.—A Middle-English Dictionary, containing words used by English writers from the twelfth to the fifteenth century, by Francis Stratmann. New edition, rearranged, revised, and enlarged, by Henry Bradley (1891). The earlier edition of this work appeared under the title *Dictionary of the Old English Language.*

Altengtische Sprachproben nebst einem Wörterbuch herausgegeben von Eduard Mätzner. The first volume is made up of selections; the second (1878–91) is the dictionary proper, and has appeared through the letter *L.* The title "Altenglisch" is used to designate what is now, in English, generally called "Middle English."

A Concise Dictionary of Middle English, by A. L. Mayhew and W. W. Skeat (1888, 272 pp.).

Dictionaries of Old English (Anglo-Saxon).—An Anglo-Saxon Dictionary, based on the manuscript collections of Joseph Bosworth, edited and enlarged by Northcote Toller (4 parts, A–Sw complete, 1882–92).

Grein, *Sprachschatz der angelsächsischen Dichter*, 2 vols., 1861–64 (vols. iii. and iv. of the *Bibliothek der angelsächsischen Poesie*). An abbreviated form of same by Grosehopp (1883), and in English form, Harrison and Baskerville, *A Handy Poetical Anglo-Saxon Dictionary* (1885).

Leo, H., *Angelsächsisches Glossar* (1877).

The Most Available Greek Dictionaries.—Liddell and Scott, *Greek-English Lexicon*, 7th edition (1889); also various abridged editions.

Yonge, C. D., *English-Greek Lexicon* (1870); also an abridged edition.

Thayer, J. H., *Greek-English Lexicon of the New Testament*, translated, revised, and enlarged from Grimm's Wilke's *Clavis Novi Testamenti* (1889).

Sophoeles, E. A., *Greek Lexicon of the Roman and Byzantine Periods* (1870); memorial edit. revised by J. H. Thayer (1887).

Contopoulos, N., Λεξικὸν Ἑλληνοαγγλικόν (*Modern Greek-English*), 3d edit. 1889; also a vol. for English-Modern Greek.

Cremer, H., *Biblico-Theological Lexicon of New Testament Greek* (1887).

Pape, W., *Wörterbuch der griechischen Eigennamen* (proper names), 2 vols.

Stephanus, H., *Thesaurus Linguæ græcæ* (Greek-Latin); best edit. edited by Hase, C. B., Dindorf, G., Dindorf, L. (Paris, 1831–65).

The Most Available Latin Dictionaries.—Harper's Latin Dictionary, based on Freund's *Latin-German Lexicon*, edited by E. A. Andrews and revised by C. T. Lewis and C. Short (1886).

White and Riddle, *Latin-English Dictionary* (2 vols., 1880), abridged (1865); *English-Latin Dictionary* (1870).

Forcellini, Aeg., *Totius Latinitatis Lexicon*; 5th edit. revised by V. De Vit (6 vols., 1858–75); *Onomasticon totius Latinitatis*; 5th edit. revised by De Vit (1859–). The most complete of all the Latin lexicons.

Georges, K. E., *Deutsch-Lat. und Lat.-Deutsches Wörterbuch* (4 vols., 1880–85). A very serviceable work, accurate and compact. The best of the Latin dictionaries in German.

Du Cange, C. D., *Glossarium mediæ et infimæ Latinitatis*, edited by Henschel (10 vols., 1882–88).

Best Dictionaries of Modern European Languages (into English).—Flügel, *A Universal English-German and German-English Dictionary* (3 vols.; fourth thoroughly revised edition, 2 vols., appeared 1891). Altogether the best.

Grieb, C. F., *Dictionary of the English and German Languages*, 3 vols. (1885); Lucas, N. J., *Dictionary of the English and German Languages* (4 vols., 1868); Whitney, W. D., *German and Engl. Dict.* (1877); Köhler, F., *German and English Dictionary* (1881); the best of the smaller dictionaries. Eger, *Technological Dictionary in the English and German Languages* (1886).

Calisch, *Complete Dictionary of English and Dutch Languages* (2 vols., 1890); Picard, A., *Pocket Dictionary of English-Dutch and Dutch-English Languages* (1877); Ferrall-Repp-Rosing, *Danish-English and English-Danish Dictionary* (1873); Larsen, A., *Danish-Norwegian-English Dictionary* (1884); Geelmuyden, J., *English-Norwegian Dictionary* (1887); Nilsson-Widmark-Bollin, *English-Swedish Dictionary* (1889); Oman, V. E., *Swedish-English Dictionary* (1889).

Spiers and Surenne, *French and English Pronouncing Dictionary* (1891); Gasc, F. E. A., *English-French and French-English Dictionary* (1889); Hamilton-Legros. *Dictionnaire International Français-Anglais* (1888); Bellows, J., *Pocket Dictionary French-English and English-French* (1877); an ideal pocket dictionary; compact, accurate, and arranged on such a plan that the exact use of the words can usually be easily determined.

Baretti, J., *Italian-English and English-Italian Dictionary* (1877); James and Grassi, *Dictionary of English and Italian Languages* (1884); Millhouse, J., *New English and Italian Pronouncing Dictionary* (2 vols., 1889).

Velasquez, M., *Pronouncing Dictionary of the Spanish and English Languages* (2 vols., 1889), abridged (1889); Neuman and Baretti, *Dictionary of the Spanish and English Languages* (2 vols., 1874); Lopez and Bensley, *New Dictionary of the Spanish and English Languages* (1878); Valdez, J. F., *Portuguese-English and English-Portuguese Pronouncing Dictionary* (2 vols., 1879); de Lacerda, José, *New Dictionary of Portuguese and English Languages* (2 vols., 1871); Elwes, A., *Portuguese-English and English-Portuguese Dictionary* (1888); Contopoulos, N., *Greek-English and English-Greek (Modern Greek) Lexicon* (1889); Alexandrow, A., *Comptete English-Russian Dictionary* (2 vols., 1879); Pawlowsky, J., *Pocket Dictionary of the English and Russian Languages* (1874); Baranowski, J. J., *Anglo-Polish Lexicon* (1884); Redhouse, J. W., *Turkish and English Dictionary* (1887); Bizonfy, F., *English-Hungarian Dictionary* (1878); *Hungarian-English* (1886).

For dictionaries of other languages see under head of special languages.

Etymological Dictionaries.—Those on English have already been mentioned under the special head of English. The following list contains the titles of the most important works of present scientific value:

Fick, A., *Vergleichendes Wörterbuch der indogermanischen Sprachen* (4 vols., 3d edit. 1876); of 4th edit. one vol. appeared (1890). The only etymological dictionary covering the whole field of Indo-European speech which is at all in accord with the present status of science.

Pott, A. F., *Wurzetwörterbuch der indogerm. Sprachen* (6 vols., 1876). Though now entirely antiquated in its scientific point of view, it remains a storehouse of valuable and suggestive material.

Curtius, G., *Grundzüge der griechischen Etymologie* (5th edit. 1879); in Engl. translation by Wilkins and England (2 vols., 1886). This work offers the fullest collection of material available, but in its theories of scientific etymology is already antiquated, and can no longer be quoted as an authority.

Vaniček, A., *Griechisch-Lateinisch etymologisches Wörterbuch* (1877). Absolutely lacking in critical value, but useful for its references to the earlier literature of the subject.

Prellwitz, W., *Etymologisches Wörterbuch der griech. Sprache* (1892). The best available handbook, but it contains no references to the literature of the subject, and is not free from a certain laxity in the application of phonetic laws.

Wharton, E. R., *Etyma Græca* (1882). Contains little independent material.

Pape, W., *Etymologisches Wörterbuch der griech. Sprache* (1836). This is not strictly an etymological dictionary, but

is a collection of the word-material of the language arranged according to endings or suffixes, and is often of great convenience for etymological or grammatical purposes.

Vaniček, A., *Etymologisches Wörterbuch der lateinischen Sprache* (1881); uncritical. Wharton, E. R., *Etyma Latina* (1890); a convenient handbook. Bréal-Bailly, *Dictionnaire Étymologique Latin* (1886); intended especially for school use; words are arranged into convenient groups around their primitives. Postgate and Vince, *Dictionary of Latin Etymology* (in preparation). A Latin etymological dictionary by Prof. Osthoff, of Heidelberg, is also in preparation. There follow two dictionaries of Greek loan-words in Latin which are serviceable for etymological purposes: Weise, F. O., *Die griech. Wörter im Lateinischen* (1882); Saalfeld, G. A., *Tensaurus Italogræcus* (1884).

Diez, F., *Etymologisches Wörterbuch der romanischen Sprachen* (1887). Körting, G., *Lateinisch-Romanisches Wörterbuch* (1892). This is really an etymological dictionary of the Romance languages, having its material arranged according to the form of its sources, i. e. generally under the Latin form; a most valuable book. Brachet, A., *Etymological French Dictionary*, translated from French by G. W. Kitchin (1878). Scheler, A., *Dictionnaire d'Étymologie Française* (1880). The great French dictionary of Littré (4 vols. and suppl., 1874–84) is also invaluable for its etymological material. Coelho, F. A., *Diccionario manuel etymologico da Lingua Portuguesa* (1890). Schade, O., *Altdeutsches Wörterbuch* (2d edit. 1872–82). Kluge, F., *Etymologisches Wörterbuch der deutschen Sprache* (4th edit. 1889). The fourth edition has appeared in English translation. One of the best etymological dictionaries of any language. Weigand, F. L. K., *Deutsches Wörterbuch* (2 vols., 1882). Of first importance for the modern German, especially for the development of signification, is the monumental work begun by the Grimm brothers. Grimm, J. and W., *Deutsches Wörterbuch* (begun in 1852 still (1893) incomplete).

Feist, S., *Grundriss der gotischen Etymologie* (1888).

Balg, G. H., *A Comparative Glossary of the Gothic Language* (1887–90).

Miklosich, F., *Etymologisches Wörterbuch der slavischen Sprachen* (1886).

Meyer, G., *Etymologisches Wörterbuch der albanesichen Sprache* (1891).

Scientific Dictionaries. — Dictionaries explaining the meanings of words peculiar to the arts or sciences or the technical or scientific meanings of words also in general usage have multiplied with great rapidity, keeping close to the development of the arts and sciences themselves. This is rendered necessary by the fact that the vast terminology of the arts and sciences precludes the incorporation of a great portion of their terms in any general dictionary. All the more important technical or scientific dictionaries, as of chemistry, electricity, mechanics, medicine, law, philosophy, theology, etc., are found in most public libraries.

BENJ. IDE WHEELER.

Dic'tyogens [from Gr. δίκτυον, net + root of Gr. γένος, race]: a name proposed by Lindley for a sub-class of plants included by other botanists among monocotyledonous plants. While they agree with the latter in the structure of the embryo, they are distinguished by having net-veined instead of parallel-veined leaves, and the growth of their stems appears to partly resemble that of dicotyledons and partly that of monocotyledons. The most important families referred to this class are *Dioscoreaceæ* and *Smilaceæ*, and among the plants are the different species of yam and sarsaparilla.

Dic'tys Creten'sis: an apocryphal history or journal of the Trojan war (*Ephemeris Belli Trojani*) in six books, purporting to have been written by a certain Dictys, who went with Idomeneus, King of Crete, to Troy. The original, written on bark in Phœnician characters, is said to have been discovered in the thirteenth year of the reign of Nero, who ordered it to be translated into Attic Greek. The work in its present form is probably a compilation of the fourth century. Scholars are still divided as to whether it is or is not a translation of a Greek original. The professed Latin translator, L. Septimius, dedicates his work to Q. Aradius. There are many imitations of Sallust, Vergil, and other Latin writers. Dictys and Dares were very popular in the Middle Ages, and from them many Homeric legends were introduced into Romance. See edition by R. Meister (Leipzig, 1872) and article DARES.

M. WARREN.

Dicyn'odon [from Gr. δι-, two + κυν-, nomin. κύων, dog + ὀδούς, tooth]: a genus of fossil reptiles whose remains have been found in South Africa. Animals of this genus united in their structure the characteristics of different reptiles. The closed orbits and sharp, compressed jaws covered with a horny plate ally it closely to the tortoise, but it also has affinities with the lizard and crocodile. It takes its name from a pair of sharp-pointed tusks growing downward, one from each side of the upper jaw. The articulating surfaces of the vertebræ being hollow, it may be supposed that these reptiles were good swimmers; and if they were inhabitants of the water, the construction of the bony passages of the nostrils proves that they must have come to the surface to breathe air.

Didactic [from Gr. διδακτικός, pertaining to teaching; διδάσκειν, teach]: skilled in teaching, imparting instruction. Didactic poetry aims chiefly to teach some art, science, or system of philosophy. Among the most remarkable examples of ancient didactic poems are Lucretius's *De Rerum Naturâ* (designed to explain and defend the philosophy of Epicurus), which Macaulay pronounces "the finest didactic poem in any language"; Vergil's *Georgics* (a treatise on agriculture); and Horace's *De Arte Poeticâ* (*On the Poetic Art*). Many fine didactic poems have also been written in modern times. Among the principal of these are Vida's *Art of Poetry* (*De Arte Poeticâ*); Boileau's *Art of Poetry* (*L'Art poétique*); Pope's *Essay on Criticism* and *Essay on Man*; Darwin's *Botanic Garden*; and most of Cowper's longer poems.

Didel'phia [from Gr. δι-, twice + δελφύς, womb, in allusion to the double condition of the uterus]: that one of the three sub-classes of mammals containing the marsupials, or pouched mammals, equivalent to the *Metatheria* of Huxley. Contrasted with *Ornithodelphia*, the *Monotremes*, or egg-laying mammals, and the *Monodelphia*, or placental mammals. See MAMMALS and MARSUPIALIA.

F. A. L.

Didelphys: See OPOSSUM.

Diderot, dēē'drō', DENIS: French philosopher; b. at Langres, Oct. 5, 1713; educated by the Jesuits, and destined for the Church and later for the law, but eagerly embraced the study of literature. His father, a prosperous cutler of stern character, withdrew from him all support upon his refusal to pursue his professional studies. Among his first writings were a free translation of Shaftesbury's *Inquiry Concerning Virtue and Merit*, with comments of his own; *Philosophic Thoughts* (1746), soon followed by the essay *On the Sufficiency of Natural Religion*, in both of which he presented the rationalistic objections to revealed religion; and *Lettre sur les Aveugles* (1749), in which he showed the dependence of men's ideas upon the five senses, and foreshadowed the modern theory of variability and the survival of the fittest. He suggested too the possibility, since realized, of teaching the blind to read by the sense of touch. This work established his reputation, but cost him a year's imprisonment. His earlier works were all written under the stress of poverty. His reputation is founded chiefly on the *Encyclopædia* (*Encyclopédie, ou Dictionnaire raisonné des Sciences, des Arts et Métiers*), of which he and D'Alembert were joint editors. He wrote the articles on ancient philosophy, history, and on the arts and trades, and supervised other parts of the work. He expended many years on this arduous labor, for which he was qualified by great quickness of intellect and extent of information. Grimm expressed the opinion that he had perhaps the most encyclopædic head that ever existed. The first volume of this work was published in 1751. The Government suspended the publication because it revealed too progressive a spirit. The ideas which seemed so radical and dangerous to the governing class of France in 1759 sound strangely commonplace to the modern reader of the *Encyclopædia*. It did not advocate atheistic views, nor did it directly attack either the Church or the state; but it took for granted the righteousness of religious tolerance, it exalted scientific knowledge and peaceful industry, and it assumed that the condition of the mass of the people should be the chief object of public concern. The tendency of all this was hostile to the spirit of the old *régime*. In spite of the suspension the work was clandestinely continued, but the greater contributors feared to compromise themselves by writing for an illegal publication, and for seven years Diderot worked almost unaided, finishing several hundred articles, reading proofs and attending to the details of the workshop, in the midst of repeated insults and the frequent interference of the police. It was completed in 1765. In that year Catharine II. of Russia granted him a pension and invited him to St. Petersburg, whither he went in 1773, but he soon returned

to France. Among his works are novels entitled *The Nun* and *Jacques the Fatalist.* He is considered as the chief of the skeptical philosophers called Encyclopædists. D. in Paris, July 30, 1784. His complete works were published by Naigron (15 vols., 1798; new ed. 22 vols., 1821). See Damiron, *Mémoire sur Diderot* (1852); Carlyle, *Essay on Diderot*; Rosenkranz, *Leben und Werke Diderots* (2 vols., 1866); Morley, *Diderot and the Encyclopædists* (2 vols., 1878).

Revised by F. M. Colby.

Didier, dĕĕ′di-ā′, Jules: landscape and animal painter; b. in Paris, May 26, 1831. Pupil of Léon Cogniet and Laurens; Grand Prix de Rome 1857; medals, Salons, 1866 and 1869; third-class medal, Paris Exposition, 1889. One of his best works, *Farm in Roman Campagna*, is in the Luxembourg Gallery, Paris. Studio in Paris. W. A. C.

Did'ius, Salvius Julianus: a Roman emperor; b. at Milan in 133 A. D. He had a high command in the army, and was chosen consul with Pertinax, after whose death, in 193 A. D., the prætorians offered the empire at public auction to the highest bidder. Didius, who was very rich, gave 6,250 drachmas to each soldier, and was proclaimed emperor. After reigning nearly two months he was killed in his palace by his soldiers, June 1, 193. He was succeeded by Severus.

Di'do (i. e. the fugitive), whose real name was **Elissa** or **Elisa**: a daughter of the Tyrian king Belus or Agenor, after whose death she and her younger brother Pygmalion (Pilmelium) were to reign conjointly. But Pygmalion, aided by democratic partisans, usurped the whole authority, and procured the assassination of her husband and uncle (the Sichæus of Vergil). She then fled with many Tyrians by sea, and founded Carthage about 870–860 B. C. Hiarbas, King of Numidia, demanded her hand in marriage, threatening war in case of refusal, and to escape this fate Dido stabbed herself upon a funeral pile. Vergil has been charged with committing an anachronism in representing her as contemporary with Æneas. See Vergil's *Æneid* (i., ii., and iv.).

Didon, dĕĕ′dōṅ′, J. Henri, Père: a French Dominican preacher and writer; b. Mar. 17, 1840; has attracted much attention for his series of eloquent Lenten sermons. Having come into conflict with his superiors because of his views about democracy, he ceased for a time to preach. His leisure was spent in preparing a life of Jesus which should be an antidote to the skeptical *Vie de Jesus* of Renan. The result was his *Jésus-Christ* (2 t., 1891), a book which moved Paris and France deeply. He has also written a book about Germany, *Les Allemands* (1884).

A. R. Marsh.

Didot, dĕĕ′dō′, François: printer; b. in Paris in 1689; founded there a famous house of printers and type-founders. D. Nov. 1, 1757. The business was carried on by his sons, François Ambroise (b. in 1730, d. July 10, 1804), who made improvements in the printing-press and paper manufacture, and Pierre François. Of the sons of the former, Pierre (b. 1760, d. Dec. 31, 1853, leaving as his successor his son Jules) took charge of the printing-house in 1789, and published magnificent folio editions of Vergil, Horace, Racine, and other classical authors; and Firmin (b. 1764, d. Apr. 24, 1836) took charge of the type-foundry, improved the art of stereotyping, and became known also as an author and translator. His business was inherited by his sons, Ambroise Firmin (b. Dec. 20, 1790, d. Feb. 22, 1876) and Hyacinthe Firmin (b. Mar. 11, 1794, d. Aug. 6, 1880).

Didron, dĕĕ′drōṅ′, Adolphe Napoléon: French archæologist; b. at Hautvillers, Marne, Mar. 13, 1806. He began in 1844 to publish *Annales Archéologiques*, devoted to mediæval art and antiquities, which he continued to twenty-seven quarto volumes. This work was completed, long after his death, by the twenty-eighth volume, which included a general index. It is a valuable storehouse of mediæval art and archæology. His chief works are a *Manual of Christian Iconography* translated from an ancient manuscript, and *Christian Iconography* (1843), which forms a history of the representations of the persons of the Trinity in art, their attributes, etc. D. Nov. 13, 1867.

Didym'ium [from Gr. δίδυμος, twofold]: an element separated by Mosander in 1842 from the mineral *cerite.* Its occurrence with lanthanum led to the name didymium, which refers to the twinlike relation between the two metals. According to von Welsbach, the element hitherto called didymium is a mixture of two elements which can be separated by repeated crystallizations of the nitrates. One of these he calls *praseodymium*, the other *neodymium.* When a salt of one is mixed with a salt of the other a salt of didymium is obtained. Crookes, however, did not succeed in separating didymium into two distinct substances. Didymium is more closely allied to bismuth than to any other common element. Its chemical symbol is Di, and its atomic weight about 143. Ira Remsen.

Did'ymus (The Blind): one of the most learned men of his age; b. at Alexandria, A. D. 308; became blind in his fifth year. He was at the head of the theological school in Alexandria from 390 to 395, the year in which he died. His extant works are a treatise upon the *Spirit*, a treatise upon the *Trinity*, the work *On the Canonical Epistles*, and the treatise *Against the Manichæans.*

Didymus of Alexandria: Greek grammarian, surnamed for his industry Chalcenterus (Brazenbowels); b. about 63 B. C.; lived in Rome, and is said to have written more than 3,500 "books," chiefly commentaries on Greek authors. To Didymus and his excerptors we owe much of our knowledge of the learned investigations of the Alexandrian scholars. See M. Schmidt, *Didymi Chalcenteri Fragmenta* (1854).

Basil L. Gildersleeve.

Die: in coinage, the instrument by which impressions are stamped upon coins. The intended device is first engraved by hand upon a plug of forged steel, which is softened for the purpose by heating, and which, when complete, is hardened and is called a *matrix.* From this, coins, medals, or the like could be struck directly, but it is more usual to make dies from it by means of a punch. For this purpose, by means of a powerful fly-press, an impression in *relief* is taken upon another piece of soft steel, which, when duly shaped and hardened, is called the *punch.* From this again impressions upon pieces of steel are taken, which, being shaped in the lathe and tempered, are the *dies*, and which are, of course, exact reproductions of the original die or matrix. A good pair of dies will sometimes yield from 200,000 to 300,000 impressions before they become too much worn for use. The engraving of dies, technically called *die-sinking*, has acquired increased importance on account of the great extension of the process of stamping metal. Many kinds of work formerly made by the hammer and punch are now shaped by a few blows between suitable dies. As examples of these may be mentioned the ornamental work of gas-fittings, buttons, common jewelry, ornamental trays, dishes, boxes, small parts of firearms, etc. For such purposes a pair of dies is required—one in relief, the other in intaglio—and the metal is pressed between them. The astonishing cheapness of many of the metallic wares is mainly due to the use of dies for doing by a single blow the work that formerly required long and tedious manipulation.

Die, in architecture, is that part of a pedestal which lies between its base and its cornice.

Die (plu. Dice): See Dice.

Diebitch, dee′bitch (surnamed Sabalkanski), Hans Karl Friedrich Anton, Count: Russian general; b. in Silesia, May 13, 1785. He served at the battle of Austerlitz 1805, and became a major-general in 1812. Having distinguished himself at the battles of Lützen, Dresden, and Leipzig, he was raised to the rank of lieutenant-general in 1813. He was appointed chief of the imperial staff about 1820. Having obtained command of an army in the war against the Turks, he took Varna in 1828, and became general-in-chief in 1829. He defeated the Turks at Kulevdcha and Silistria and crossed the Balkans, hence his title Sabalkanski (crosser of the Balkans). With an army that had dwindled to 20,000 he penetrated almost to Constantinople, which was expected every moment to fall into his hands, but the jealousy of the great powers brought about an adjustment in the treaty of Adrianople, Sept. 14, 1829. He was raised to the rank of field-marshal, and in Jan., 1831, took command of an army sent to subdue the Polish insurgents. D. of cholera June 10, 1831. See Belmont, *Graf Diebitsch* (1830).

Dieckhoff, deek′hof, August Wilhelm, D. D.: Lutheran theologian; b. in Göttingen, Prussia, Feb. 5, 1823; was resident privat docent and professor extraordinary and ordinary there 1847–60. Since 1860 he has filled the chair of Historical Theology at the University of Rostock, and is a member of the Consistorium of Mecklenburg. He has been a voluminous author on subjects chiefly of a dogmatico-historical character; has been prominent in his attacks

upon the theology of Ritschl and of the Missourians, and in 1891 published a pamphlet on the doctrine of inspiration, in which he dissents from the Lutheran theologians of the seventeenth century. HENRY E. JACOBS.

Diedenhofen, dee'den-hō-fen: the German name for THIONVILLE (*q. v.*).

Diefenbach, LORENZ: philologist; b. at Ostheim, Hesse-Darmstadt, July 29, 1806; was educated at the University of Giessen, and became the pastor and librarian at Solms-Laubach for twelve years. Greatly interested in religious reform he was one of the chiefs of the German Catholic party, and was elected as deputy from Offenbach to the Frankfort parliament of 1848. In 1865 he was appointed second librarian to the city of Frankfort. In 1876 he retired to Darmstadt, where he died Mar. 28, 1883. As a writer he was indefatigable. Poetry and romance, as well as philosophical works of great value, attest his remarkable industry. The most important of his writings are *Celtica* (3 vols., 1839–40); *Vergleichendes Wörterbuch der Gothischen Sprache* (2 vols., Frankfort, 1846–51); *Glossarium Latino-Germanicum Mediæ et Infimæ Ætatis*, a supplement to Ducange's *Glossary* (1857); *Origines Europææ* (1861); *Hoch- und Nieder-Deutscher Wörterbuch* (1874–85).

Dieffenbach, dee'fen-bă*kh*, JOHANN FRIEDRICH: surgeon; b. in Königsberg, Prussia, Feb. 1, 1794. He graduated in 1822, and began to practice in Berlin, where he gained a high reputation; became professor in the university there in 1832; noted for his plastic operations. Author of *Chirurgische Erfahrungen* (4 vols., 1829–35); *Durchschneidung der Sehnen und Muskeln* (1841); *Ueber das Schielen* (1842); and *Operative Chirurgie* (2 vols., 1844–49). D. Nov. 11, 1847. F. M. C.

Diego Garcia Island: See CHAGOS ARCHIPELAGO.

Diego-Suarez, dĕe-ā'gō-swaa'res: town and bay (also Antomboka Bay); on the northeast coast of Madagascar; ceded by the Hova Government with a small surrounding district to France in 1885 (see map of Africa, ref 7–I). The harbor is one of the best in Madagascar. The governments of Nossi-Bé and Ste.-Marie de Madagascar were united with that of Diego-Suarez in 1890. Pop. (1887) 4,007. C. C. ADAMS.

Diegueño: See YUMAN INDIANS.

Diel du Parquet, JACQUES: French soldier and administrator; b. about 1600. He was in the West Indies with his uncle, d'Enambuc, or d'Esnambuc, and succeeded him in 1638 as chief of the infant colony at Martinique. This position was confirmed by the French West Indian Company, who gave him the title of seneschal, with the rank of lieutenant-general. His rule was efficient and generally prosperous, though he had some trouble with a rebellious governor of St. Christopher's (1643) and with the Caribs. In 1650 he went to France and bought for 60,000 livres the proprietorship and government of St. Lucia and Grenada, islands which at that time had not been colonized. The English opposed him at St. Lucia, and gained possession of that island 1654. Diel du Parquet successfully established a French colony at Grenada, but in his absence the Caribs of the island attacked it. A war ensued, in which the greater part of the Grenada Caribs were exterminated, the survivors submitting. The Caribs also attacked Martinique, where Du Parquet only escaped through timely aid received from some Dutch ships. D. at St.-Pierre, Martinique, Jan. 3, 1658. HERBERT H. SMITH.

Dielectric [*di-* (= Gr. δι*ά*, through) + *electric* (see ELECTRICITY)]: any medium within which it is possible to set up an electrostatic field of force; in other words, any substance through which electrostatic induction will take place. Dielectrics are, as a class, insulators rather than conductors of electricity. Solids, liquids, and gases alike possess the dielectric property, although in varying degrees. The dielectric value (specific inductive capacity) of each substance is measured by the ratio of the capacity of a condenser in which it forms the insulator, to the capacity of the same condenser with a vacuum as a dielectric. For a table of dielectric constants thus determined, see INDUCTIVE CAPACITY, SPECIFIC.

On the electro-magnetic theory of light, according to which the medium which transmits radiation is the same as that through which induction takes place, there should be a definite relation between the specific inductive capacity of a substance and its index of refraction, the square root of the former constant being equal to the index of refraction for very long waves. It has been shown by Arons and Rubens (*Wiedemann's Annalen*, xlii., p. 581, and xliv., p. 206, 1891), and by Rubens (*Wiedemann's Annalen*, xlv., p. 257, 1892), that in so far as the two constants have been determined, the above relation holds true. E. L. NICHOLS.

Dielman, deel'măn, FREDERICK: genre-painter; b. in Hanover, Germany, Dec. 25, 1848. Pupil of the Munich Academy; National Academician 1883. Removed to the U. S. when quite a young man, and spent six years in the U. S. engineering department in Virginia. One of the first pictures he exhibited was *A Patrician Lady*, at the National Academy in 1877. He was elected President of the Academy in 1899. Studio in New York.

Diels, deels, HERMANN: classical scholar; b. in Hamburg, Germany, May 18, 1848; graduated at Bonn in 1870; professor at the University of Berlin since 1880, and member of the Berlin Academy. In 1879 appeared his epoch-making work, *Doxographi Græci*, in which the sources of the doctrines of Greek philosophers as handed down by post-Aristotelian scholars are for the first time determined. Other publications are an edition of Simplicius's *Commentary on the Physics of Aristotle*; a celebrated treatise on the *Chronica of Apollodorus* (Rhein. Mus. xxxi., p. 1 ff.); on *Aristotle, Rhet.* bk. iii., *Empedocles* and *Gorgias*, *Seneca* and *Lucan*, *Leucippos* and *Democritos*, *Sibyllinische Blätter* (1891). He is one of the editors of the *Archiv f. Gesch. der Philosophie*, begun in 1887. ALFRED GUDEMAN.

Diemen, dee'men, ANTHONY, van: naval officer; b. at Kuilenburg, Holland, in 1593. He served for many years in the East Indies, and became an admiral. He was appointed governor-general of the Dutch East Indies in 1636, and sent out in 1642 an exploring expedition under Abel Tasman, who discovered Van Diemen's Land. D. at Batavia, Apr. 19, 1645.

Die'penbeck, written also **Diepenbeke**, ABRAHAM, van: historical painter; b. at Bois-le-Duc, Holland, in 1607 or, according to some authorities, in 1596; was a pupil of Rubens, and after a residence in Italy became his assistant. In 1641 he was chosen director of the Academy of Antwerp. He painted with facility on glass, but devoted especial attention to oil-painting and designing; imitated Rubens with great freedom, and gained a high reputation by his skill in composition and coloring. Among his works is a series of fifty-eight designs called *The Temple of the Muses*. D. in Dec., 1675.

Dieppe, dĕe'ep': seaport-town of France: department of Seine-Inférieure; on the English Channel; at the mouth of the river Arques, and at the northern terminus of the Rouen and Dieppe Railway; 33 miles N. of Rouen, and 143 miles by rail N. W. of Paris; lat. 49° 55′ N., lon. 1° 5′ E. (see map of France, ref. 2–E). It stands between two high ranges of chalk cliffs, and is defended by a wall and a castle built on a high cliff. Vessels of 500 tons can enter the harbor at high water, but at low tide the harbor is nearly dry. Dieppe has a college and a school of navigation, a theater, a public library, and manufactures of watches, lace, fine linen, paper, and ivory wares. Ship-building, distilling, and fishing are important industries. In the fifteenth and sixteenth centuries its commercial importance compared favorably with that of the Italian cities. It became a center of Protestantism, and its inhabitants were among the first to support Henry IV. No city of France suffered more severely from the Revocation of the Edict of Nantes (1685). It is one of the most fashionable watering-places of France, and is a favorite landing-place of British tourists visiting France. Its import and export trade is chiefly with England and Norway. Pop. (1896) 22,439.

Di'es I'ræ: a Latin hymn, probably written in the thirteenth century by a Franciscan friar, Thomas da Celano, commencing—

> Dies Iræ, dies illa,
> Solvet sæclum in favilla,
> Teste David cum Sibylla.
>
> Day of Wrath! On that dread day
> In ashes earth shall pass away,
> Attest the King's, the Sibyl's, lay.

The Western Church soon gave it a place in its offices as the "Sequence for the Dead," so called because in the Roman mass it is sung between the Epistle and the Gospel, following immediately after the Gradual Hymn, when that is sung. In an English form it has also been adopted into the hymn-books of the Church of England and others. It is chief among the "seven great hymns of the mediæval

Church." among which are *Jerusalem the Golden*, *Come, Holy Ghost* (*Veni, Sancte Spiritus*), etc. Of all these sacred lyrics none can compare in point of sublimity or touching pathos with the *Dies Iræ*. For centuries it has been the favorite alike of Roman and Protestant Christendom.

The composition is evidently suggested by the words of Zephaniah, in the Vulgate (Zeph. i. 15, 16); in English: "*That Day, a Day of Wrath*, a day of trouble and distress, a day of wasteness and desolation, a day of darkness and gloominess, a day of clouds and thick darkness, a day of the trumpet and alarm against the fenced cities and against the high towers!"

The translations into modern languages are numbered by scores, perhaps by hundreds; but the Latin verse of the Franciscan monk, simple and easy as it appears at the first glance, has in it a secret force which baffles the ingenuity and skill of translators. Among the versions complete or incomplete in English may be mentioned one ascribed to the Earl of Roscommon, the condensed rendering by Sir Walter Scott in the *Lay of the Last Minstrel*, one by W. J. Irons, D. D., that of Gen. John A. Dix while he was in command of Fortress Monroe during the civil war in the U. S., and thirteen versions by Dr. Abraham Coles. The words of the *Dies Iræ* constitute the principal subject of the music of the famous *Requiem* of Mozart.

Revised by E. S. Sheldon.

Di'esis [Gr. δίεσις, a letting through, a semitone; διά, through + ἵέναι, let go]: in music, an interval less than a comma. The harmonical diesis is the difference between the small and the great semitone, as from C to C sharp, and from C to D flat.

Dies non, or, in full, **Dies non juridicus**: a day that is not a court-day; that is, a day upon which courts do not sit, and upon which process can not ordinarily issue, be executed, or returned. Every legal holiday is a *dies non*, as well as such other days as may be fixed by law.

F. Sturges Allen.

Diesterweg, dees'ter-*vāch*, Friedrich Adolph Wilhelm: educator; b. at Siegen, Prussia, Oct. 29, 1790; educated in the Latin School there, and at the Universities of Herborn and Tübingen 1808–11; taught at Mannheim and Worms 1811–13. In 1813 he was called to the Model School in Frankfort, where he became associated with some of Pestalozzi's pupils, and came under the influence of Pestalozzi's ideas. July 3, 1820, he became director of the Teachers' Seminary at Mörs, and director of the City Normal School in Berlin 1832–47. In 1851 he was pensioned by the Government. The remaining years of his life were employed mainly in literary work. He founded the *Pädagogische Jahrbuch*, and in 1859 was elected a member of the Prussian Chamber of Deputies. Among his very numerous educational writings are *Heinrich Pestalozzi* (1846); *Wegweiser zur Bildung deutscher Lehrer*; and *Rheinische Blätter*, of which he was the editor. Diesterweg early determined to devote himself to the building up of the common schools. His great service to education was in the line of the training of teachers. He was the first, in Germany at least, to recognize that a good practice school is indispensable in connection with every institution for the professional education of teachers. D. in Berlin, July 7, 1866.

C. H. Thurber.

Diet [O. Fr. *diete* < Lat. *diæta* = Gr. δίαιτα, manner of living]: See Food and Nutrition.

Diet (Late Lat. *diæta*): the assembly of the German states, probably deriving its origin from the national assemblies of the ancient Teutons. During the Middle Ages it was a feudal body, with no trace of popular representation, and constituted the central authority in the Holy Roman Empire. It was composed of three colleges or divisions, which met and voted separately. The first, that of the electors, consisting of three spiritual and four temporal princes, whose privilege was permanently guaranteed by the Golden Bull of Charles IV. (1356), had the duty of choosing the emperor. The second college was composed of the princes of the realm, who, though not having the electoral privilege, were in all other respects the equals, and in some the superiors, of the electors. The third body, composed of the free cities, was far inferior to the other two in influence, and was not formally recognized until the Peace of Westphalia Oct. 24, 1648. The Diet met at different places, whose names are used to designate the sessions, as Diet of Worms, Diet of Spires, etc., but from 1663 down to the destruction of the Holy Roman Empire in 1806 it was held at Ratisbon. These dates, too, mark its steady decline in power and the failure to secure centralization in the German state. The German confederation (1815–66) vested its central authority in a diet which met at Frankfort, and in which the influence of Austria was generally predominant. The legislative bodies of other countries are sometimes called diets. The Diet of Hungary (*q. v.*) formerly met at Pressburg, and was active in the exciting events of 1848–49. Since 1861 it has met at Pest. The parliament of Japan, though modeled in the main on the British Parliament, is also termed a diet.

F. M. Colby.

Dieterici, dē̆e-te-reet'sē̆e, Karl Friedrich Wilhelm: political economist; b. in Berlin, Prussia, Aug. 23, 1790; became Professor of Political Economy at Berlin in 1834, director of the National Bureau of Statistics in 1844, and member of the Berlin Academy. He published, besides other works, *Public Welfare in the Prussian States* (1846), and *Manual of the Statistics of the Prussian State*, continued by his son (1858–61). D. July 29, 1859.—His son, Friedrich Dieterici, was b. at Berlin, July 6, 1821; became professor at the University of Berlin in 1850; has published a number of works on the Arabic language and literature, among which are *The Logic and Psychology of the Arabs* (1868); *The Science and Natural Philosophy of the Arabs* (1875); *Darwinism in the Tenth and Nineteenth Centuries* (1878).

Dietet'ics [from Gr. διαιτητική (sc. τέχνη, art), art of living healthfully, deriv. of δίαιτα, manner of life]: that branch of medicine which treats of food and drink. In a wider sense it may treat of the recovery or maintenance of health by means of correct habits with regard to eating, drinking, exercise, the wearing of proper clothes, etc. See Hygiene.

Dietrich, dee'trich, Christian William Ernest: painter; b. in Weimar, Oct. 30, 1712. He studied drawing with his father and with the landscape-painter Alexander Thiele. At eighteen Count Bruhl employed him to decorate his various castles. His work was so much admired that the King of Poland invited him to enter his service. After leaving this court, from jealousy of the Italian artists, and having traveled through Holland and visited his own country, he returned to Dresden and worked for the court there in 1742. He was sent to Italy to study the old masters, and painted landscape there. He imitated Rembrandt's manner as to historic painting, adding his own peculiar power in painting landscape backgrounds. Dietrich also was very able as an engraver and etcher. Impressions from two hundred plates are extant, but are very rare, because having made one impression he scraped the plate to use again. D. at Dresden in 1774.

W. J. Stillman.

Dietrichsen, dee'trik-*sen*, Lorentz Henrik Legelcke: art critic; b. in Bergen, Norway, Jan. 1, 1834. His works on art and literature are very numerous, and some of them are of great value.

R. B. A.

Dietrich von Bern: See Theodoric.

Dietz, Feodor: historical and military painter; b. at Neunstetten, Baden, May 29, 1813; pupil of Munich Academy and of Alaux and Horace Vernet, Paris. Among his works are *March to Paris in 1814*, in the National Gallery, Berlin; *Attack of Bavarians on Turks*, *Siege of Vienna*, National Museum, Munich. Died while accompanying the German army in France, at Gray, Haute-Saône, Dec. 18, 1870.

W. A. C.

Dieu et mon Droit, di-ö'ā-mōñ'drwäă' [Fr.]: See Motto.

Dieulafoy, di-ö'läă'fwäă', Marcel Auguste: engineer and archæologist; b. in Toulouse, France, Aug. 3, 1844; is famous for his explorations in the ancient monuments of Persia, described in his *Ancient Art of Persia* (1884–89) and his *Acropolis of Susa* (1890). In his work he has been assisted by his wife, who has for her part published *Persia, Susiana, and Chaldea* (1866), and *At Susa* (1887).

C. H. Toy.

Diez, deets, Friedrich Christian: philologist and founder of the scientific study of Romance philology; b. at Giessen, Germany, Mar. 15, 1794. He served against the French in 1813, and afterward continued his studies at Giessen and Göttingen. As results of his Provençal studies appeared in 1825 *Beiträge zur Kenntniss der romantischen Poesie*; in 1826 *Die Poesie der Troubadours*; and in 1829 *Leben und Werke der Troubadours* (second editions of the last two were published after his death, with additions by Bartsch). He was appointed professor at Bonn in 1830, and held that

position until his death, May 29, 1876. His two greatest works are the *Grammatik der romanischen Sprachen* (1836–43; 3d ed. 1870–72, the last during his life) and *Etymologisches Wörterbuch der romanischen Sprachen* (1853, and several editions since). He applied to the Romance languages the comparative and historical method, following most successfully the example of J. Grimm's work on the Teutonic languages. Among his other works may be mentioned *Altromanische Sprachdenkmale* (1846); *Zwei altromanische Gedichte* (1852); *Ueber die erste portugiesische Kunst- und Hofpoesie* (1863); *Altromanische Glossare* (1865).

E. S. Sheldon.

Diez, Wilhelm: genre and military painter; b. at Baireuth, Germany, Jan. 17, 1839. Pupil of Piloty, Munich; professor at the Munich Academy. His work is minutely finished, even in canvasses of considerable size. *Picnic* is in the National Gallery, Berlin. W. A. C.

Difference Engine: a calculating-machine which operates by the method of differences. Such are the calculating-machines of Babbage and Scheutz. See Calculating-machines.

Differences, Method of: in algebra, a method of finding any distant term of a series, or the sum of a definite number of terms, by means of the differences between the initial terms, the differences of their differences, and so on. *A first order of differences* is found by taking each term of the series from the next term following. Thus if the series be a, b, c, d, etc., the first order of differences is $b - a$, $c - b$, $d - c$, etc.; and the *first* of these ($b - a$) may be indicated by d_1. The *second order of differences* will be found by taking each first difference from the next following first difference, and the *first* of the second differences may be indicated by d_2. In like manner are found d_3, d_4, etc. If the law of the series be expressed by a formula in which the indices of the powers of the variable are integral, or which is capable of being transformed into such an one, the differences of the order denoted by the highest power of the variable will be equal and those of higher orders will be zero. Thus if this highest power be the m^{th}, there will be m orders of differences.

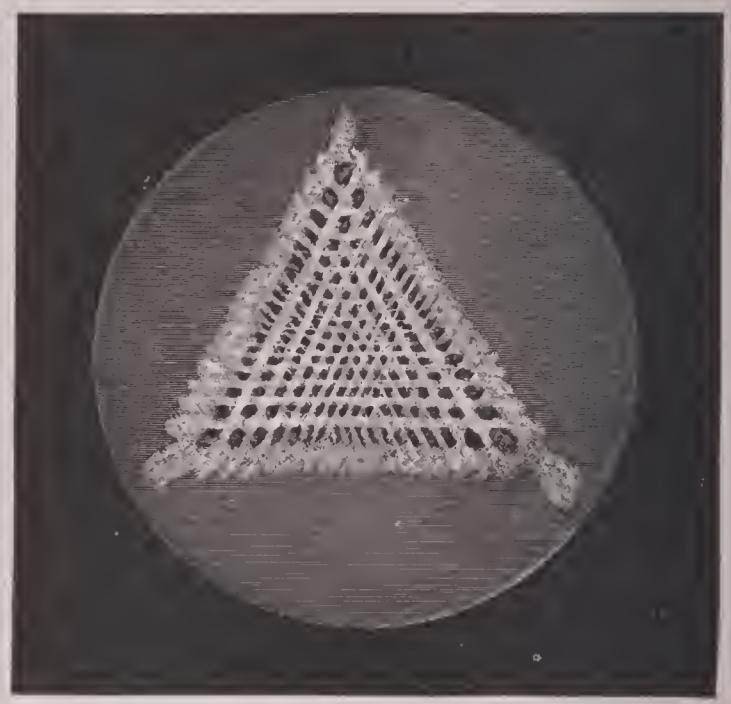
Differential: in mathematics, an infinitesimal difference between two values of a variable quantity. When a variable quantity, as x, is taken in two states indefinitely near to each other, as x and $x + h$, the infinitely small difference, h, is called the differential of the variable, and is written in analysis dx. If the given quantity is not x itself, but a function of x, say $F(x)$, then, when x becomes $x + h$, $F(x)$ becomes $F(x + h)$, and the differential is $F(x + h) - F(x)$, which may be written $F'(x, h)$. The analytic method which is founded on differentials is called the differential calculus. See Calculus.

Differential Calculus: See Calculus.

Differential Thermometer: a thermometer for indicating very slight variations of temperature. The instrument as here described was invented by Sir John Leslie. It consists of two glass bulbs connected by a narrow tube, which is usually bent in the form of a U. The bulbs are uppermost, and are filled with air, while the tube contains a column of mercury or sulphuric acid. The measurement is effected by the expansion of the air in one of the bulbs. This instrument is far more sensitive than mercurial and most other thermometers, owing to the greater expansive power of gases. It is estimated that a change not greater than the 6,000th part of a degree Fahrenheit can be indicated by it. The differential thermometer has been largely superseded for delicate measurements of temperature by the Thermopile (*q. v.*).

Differentiation: the operation in mathematics by which the differential of a function is determined. The allied operation, which leads to the determination of the derived function (or differential coefficient), is usually termed derivation. The partial differentiation of a function of two or more independent variables is the differentiation of that function, on the hypothesis that one only of these variables suffers change. Finite differentiation is the operation by which the difference of a function corresponding to a finite difference of a variable is determined. The term is also used to denote the process of development in plants and animals from simple to complex organizations.

Diffraction [from Lat. *dis-*, apart + *frangere*, *fractum*, break]: in optics, a deviation or deflection which the rays of light undergo in passing very near any opaque body. It had been observed by Grimaldi, but Newton first explained its cause. Let a beam of solar light, reflected horizontally, be admitted into a dark chamber through a small round hole, and received on a white screen. If the hole have a sensible diameter the image of the sun on the screen will suffer no sensible alteration of color; but if we place in the axis of the beam, and at a distance of 5 or 6 feet from the hole through which it is admitted, a metallic plate having a very fine puncture, and intercepting all other light than that which passes through the puncture, the appearance on the wall will be surrounded with several concentric colored rings, covering a space far exceeding in extent that which the solar beam would have occupied if its rays had followed their rectilinear direction. By substituting a very narrow slit for the puncture in the plate, or several punctures or slits close to each other, very beautiful phenomena are produced. See Optics and Color.



Diffraction fringes produced by the passage of monochromatic light through a triangular hole.

The accompanying figure shows the series of diffraction fringes formed when light is allowed to pass through a small triangular aperture and is caught upon a screen. The original photograph of which this is an enlargement (about 10 diameters) was obtained by Prof. B. W. Snow without the use of lenses, the sensitive plate being exposed in the path of a beam of monochromatic light after the passage of the rays through a minute triangular hole.

Revised by E. L. Nichols.

Digamma [Gr. δι-, two, double + γάμμα, name of third letter of Greek alphabet]: a name applied by the Greek grammarians of the Roman period to what was originally the sixth letter of the Greek alphabet as received from the Phœnicians. Its original name was *Vau*. It survived in many of the provincial alphabets, as in those of Laconia, Heraclea, Argos, Corinth, Corcyra, Megara, Crete, Phocis, Locris, Epirus, Thessaly, Bœotia, Elis, Arcadia, but in the historical period had disappeared from the alphabets of Ionia and Attica, as the sound it denoted had disappeared from the dialects of those localities. It passed over into the Roman alphabet as F from the alphabet of Chalcis, of which the Roman was only a continuation. The present standard Greek alphabet of literary use is the Ionic alphabet as used at Athens since the end of the fifth century. Dialectal and rare or obsolete words cited by the grammarians and in the old glossaries, e. g. that of Hesychios, often show the digamma under the guise of B or Γ, or even T. The last two are due to misconception of the form of the letter, the first to an attempt to approximate the sound. Traces of an existence of the sound at the period when the Homeric poems were first taking shape are found in its influence upon the quantity of syllables and its closing of apparent hiatus, though it never appears in written form. Thus in ἀτὰρ εἴπῃσι, the final syllable of the former word may be used as long on account of the *F* which was originally pronounced as initial in the latter. The loss of the sound in Greek may often also be verified by etymologies; thus οἶνος, wine : Lat. *vī'num*; ἰός, poison, Lat. *vī'rus*, etc. The sound of digamma was a

bilabial spirant, probably not unlike the German *w* in *zwei*, or Spanish *b*. Cf. Hartel, *Homerische Studien*; Meyer, G., *Griech. Grammatik*, ² §§ 229 ff.; Brugmann, *Griech. Grammatik*, ² § 13. BENJ. IDE WHEELER.

Digby: seaport-town; capital of Digby co., Nova Scotia; on railway, and on Digby Neck, Bay of Fundy; about 110 miles W. of Halifax (see map of Quebec, etc., ref. 3–A). It has an academy, exports lumber, mackerel, and herrings, and carries on ship-building. Pop. about 2,000.

Digby, GEORGE, Earl of Bristol: an English royalist noted for his instability and inconsistency in politics; b. in Madrid in 1612; was among the champions of privilege in the Long Parliament, and famous for his speech against Stafford, whom he characterized as the great apostate to the commonwealth who "must not expect to be pardoned in this world till he be dispatched to the other." And yet he would not sign the bill of attainder, and almost immediately joined the king's party. He was accused in Parliament of high treason, but went to France, whence he corresponded with the queen and his royalist friends. He returned home in 1660, and rashly impeached Lord Clarendon in 1663. He enjoyed the confidence of the king for a considerable time, however, and was much employed in the negotiations with the Spanish court concerning the Spanish-English marriage. He was the author of *Elvirah*, a comedy. D. Mar. 20, 1677.

Digby, Sir KENELM: English author; a son of Sir Everard (b. in 1581, and executed Jan. 30, 1606, for abetting the Gunpowder Plot); b. at Gayhurst, Buckinghamshire, July 11, 1603. He was a gentleman of the bedchamber at the court of Charles I., and was a royalist in the civil war. In 1636 he was converted to the Roman Catholic Church. He passed much time in France, and was an associate of Descartes. His wife was Venetia Anastasia Stanley, a well-known beauty. He wrote, besides other works, *Observations upon Religio Medici* (London, 1643); a *Treatise on the Nature of Bodies* (Paris, 1644; London, 1658); *The Body and Soul of Man*, a famous treatise on sympathetic cures; *The Cure of Wounds by the Powder of Sympathy, with Instructions how to make the said Powder* (1658); and *Private Memoirs of Sir Kenelm Digby* (first published in 1827). D. in London, June 11, 1665.

Digby, KENELM HENRY: author; b. in Ireland in 1800; educated at Cambridge, and, having become a Roman Catholic, devoted himself to scholastic theology and mediæval antiquities. He published *The Broad Stone of Honor* (1829); *Mores Catholici* (1840); *Compitum* (1851), and other works, which have many warm admirers, and are imbued with the nobler characteristics of Middle Age thought. D. in London, Mar. 22, 1880.

Digest: in legal terminology, a condensation or systematic arrangement of laws, statutes, or decisions. The name is often applied to the Pandects of Justinian. See JUSTINIAN.

Digester, Papin's [named from DENIS PAPIN (*q. v.*), a French savant, who invented it in 1681]: an invention by which bodies may be subjected to the action of high-pressure steam or water raised above its ordinary boiling temperature to 400° F., and sometimes higher. The digester is a strong boiler made of copper or iron with a tightly adjusted cover furnished with a safety-valve. It has the power of dissolving even bones, and has been employed in France to a considerable extent in preparing soup from bones.

Digestion [from Lat. *diges'tio*, arrangement, distribution; *di-*, apart + *ge'rere*, carry]: the function possessed by most animals of converting food into assimilable substances. The nature of the process naturally varies very much with the character of the food, and in certain of the very lowest forms, as also in some entozoic parasites like the tapeworms, there is no digestion at all, the nutritious materials being taken in by endosmosis. These animals form a sort of transition between animals and vegetables, the latter always directly absorbing their nutriment from the soil in which they grow.

In man digestion comprises a number of stages, beginning with the action of the saliva and ending in the intestines. In the mouth the starches of the food are converted into grape-sugar by the action of a powerful ferment, ptyalin, of the saliva. The sugar so produced is absorbed by the blood-vessels of the stomach and any starch not digested acted upon in the intestines by a ferment similar to ptyalin, though much less active. It will appear from this that thorough mixture of the food with the saliva is necessary, and that mastication must be carefully performed. Derangements of the general health, such as fevers, "colds," etc., seem to alter the character of the saliva, preventing healthy action.

In the stomach the albuminous portions of the food are particularly acted upon. The food is thoroughly commingled with the gastric juice by the various churning and rolling movements of the stomach walls. The gastric juice was first demonstrated in 1752 by Réaumur, though its presence and activity had been long before suspected. It is a clear, yellowish fluid of acid reaction, slight odor, and saltish taste. It will keep for a long time without change. The acidity of the gastric juice is due to free hydrochloric acid, and there are contained besides this various mineral ingredients, chief among which is sodium chloride. Of all the constituents the most important is an organic substance called pepsin. There is probably very little secretion of gastric juice when the stomach is at rest, but soon after ingestion of food abundant outpouring occurs. This has been found to result largely from the mere presence of something within the stomach, as it occurs when the mucous membrane is irritated through an artificial fistula leading into the organ. The quantity of gastric juice *per diem* probably varies widely, but has been stated at 14 lb.

The important function of the gastric juice is the conversion of albuminous substances into peptones, and this is accomplished by the ferment pepsin, acting by its presence rather than by itself, entering into the chemical changes. There is little action on starches or fats in the stomach, but milk is curdled by the operation of a special ferment assisted by the acidity of the gastric juice. The name CHYME (*q. v.*) is applied to the stomach contents when digestion is complete. The peptones produced are largely absorbed by the blood-vessels in the walls of the stomach; the remaining matters pass into the intestines. The rapidity of gastric digestion depends upon a great variety of conditions of the stomach, the body in general, and the food. In animals it varies greatly, requiring from twelve to twenty-four hours in a dog, and in rabbits the stomach is never entirely empty of food. There is a great difference in different kinds of food, in the manner of their preparation, and in the thoroughness with which mastication is performed. In disturbances of the general health, and especially in fevers, digestion is apt to be imperfect and retarded. Ingestion of excessive quantities of sugars, of alcohol, or of any other food retards digestion; but, on the other hand, moderate amounts of alcohol stimulate the gastric function, and moderate drinking with the meals is on this account advisable in old people in whom digestion is apt to be sluggish. The drinking of water with the meals has long been regarded as very prejudicial to proper digestion, but experimental observations fail to sustain the view, though excessive drinking, especially of cold water, would appear to be harmful.

The chyme having passed into the duodenum is further acted upon by the pancreatic juice and the bile. The starches not altered in the mouth are converted into sugar and so absorbed; albuminous substances unaffected in the stomach are changed into peptones; and fats not at all affected in mouth or stomach are broken up into a very fine emulsion and carried off in the lacteals. (See LYMPHATICS.) Conditions affecting the gastric digestion favorably or otherwise probably act also on the intestinal digestion, but the processes are here much more complex and less thoroughly worked out. Signs of intestinal indigestion resemble those of derangement of gastric digestion very closely, but are apt to come on a longer time after the taking of food—that is, when the chyme is passing into the duodenum. See STOMACH and DYSPEPSIA. WILLIAM PEPPER.

Digger Indians: See SHOSHONEAN INDIANS.

Digges: an English family, several members of which attained note as scholars and writers.—LEONARD; b. at Barham, Kent; educated at Oxford, and died about 1573. He wrote *Tectonicon: Measuring of Land*, etc. (1556), an arithmetic, and a military treatise entitled *Stratonicos*, which was enlarged by his son THOMAS (d. 1596), who edited his father's works and published *Celestial Orbs*, *Pantometria*, a geometrical work, etc.—Sir DUDLEY; son of Thomas (1583–1639); educated at Oxford; studied law; and was employed as ambassador to Russia and Holland, but afterward lost the favor of the king on account of his independence, and was even imprisoned for a short time. He was the author of *Right and Privileges of the Subject*, a correspondence

between Walsingham, Burleigh, and others concerning the marriage of Elizabeth and the Duke of Anjou (1642), and the *Compleat Ambassador* (1655).—His son DUDLEY published *Unlawfulness of Subjects Taking up Arms against their Sovereign* (1643). D. in 1642.

Dighton Rock, dī'tŭn'rok': a stone bearing a rude and unreadable inscription, attributed by some to the Northmen; stands on Taunton river in the town of Berkley, Bristol co., Mass.

Digit [from Lat. *di'gitus*, finger]: in arithmetic, one of the ten symbols, 0, 1, 2, 3, etc., by which all numbers are expressed. In astronomy the term is used in speaking of eclipses to denote the twelfth part of the diameter of the sun or moon. Thus the eclipse is said to be of ten digits if ten parts of the twelve are concealed. Digit is also a measure of dimension equal to the breadth of a finger, and estimated at about three-fourths of an inch.

Digita'lis [from Lat. *digita'le*, glove, or *digita'lis*, belonging to finger (*di'gitus*), used as translation of *thimble*; Germ. *Fingerhut*]: a genus of plants belonging to the family *Scrophulariaceæ*. With the exception of the common foxglove (*Digitalis purpurea*), which is a native of Great Britain, the species are mostly found in Southern Europe and different parts of Asia. The leaves of *Digitalis purpurea* are largely used in medicine. They are dried and reduced to powder or dissolved as an infusion or tincture. They have a very bitter taste, and are administered in diseases of the heart, to which they act as a powerful stimulant. They contain a crystalline principle called digitalin, and also digitonin, digitoxin, and digitalein. Several of the species are cultivated in gardens.

Digitate [from Lat. *digita'tus*, having fingers, deriv. of *di'gitus*, finger]: a botanical term applied to compound leaves, the leaflets of which are all borne on the apex or tip of the petiole, as the clover and horse-chestnut. Such leaves are also called *palmate*.

Digitigra'da, or **Dig'itigrades** [from Lat. *di'gitus*, finger + *gradi*, walk]: those carnivorous quadrupeds that walk on their toes, as opposed to plantigrades or those that walk on the sole of the foot. As a matter of fact, a large number of quadrupeds walk on their toes, notably the ungulates, but the term is commonly used in speaking of the carnivora. A group of carnivora is so called in the system of Cuvier. Among the digitigrada are included the cat, the dog, the hyæna, weasel, etc.

Digne, deeñ (anc. *Dinia*): town of France; capital of the department of Basses-Alpes; on the river Bléonne, 60 miles N. E. of Marseilles (see map of France, ref. 8–I). It has a cathedral, a public library, several tanneries, and a trade in almonds, prunes, grain, honey, wax, and hemp. It suffered much during the Huguenot wars. Pop. (1896) 7,276.

Dignitary [from Lat. *dig'nitas*, rank, deriv. of *dig'nus*, worthy]: in canon law, originally an ecclesiastic of higher rank than an ordinary priest. To this class exclusively belonged all bishops, deans, and archdeacons, but it now includes also prebendaries and canons. Any officer of high rank may be called a dignitary.

Dignities: See the Appendix.

Dihong, dĕe-hong', also called **Tsanpo**: the upper part of the Brahmaputra river above Assam. (See BRAHMAPUTRA). It rises on the north side of the Himalayas, traverses part of Tibet, and bursts through that mountain-chain near lat. 28° 15′ N.

Dijon, dĕe'zhōñ' (anc. *Dibio*): town of France; capital of the department of Côte-d'Or; situated in a plain on the river Ouche, at its junction with the Suzon; about 175 miles S. E. of Paris, and 120 miles N. of Lyons, with both of which it is connected by railway (see map of France, ref. 5–H). Its environs are remarkably beautiful. Dijon was formerly the capital of Burgundy, and the residence of the Dukes of Burgundy for three centuries. Originally a Roman fortified camp, it passed through many vicissitudes, being burned by the Saracens in the eighth century, sacked by the Normans in the ninth, again destroyed by fire in the twelfth, and besieged by the Swiss in 1513, but saved by the conclusion of a humiliating treaty. Severe fighting took place around it in the Franco-German war, and it was successively captured by the Germans and the French. It is well built, has spacious and clean streets, and is inclosed by ramparts. Among the principal public edifices are the palace of the Princes of Condé; the cathedral, a Gothic structure founded in the thirteenth century; the noble Gothic church of Notre Dame; a theater and town-hall. Dijon has a large public library, a botanic garden, and an *académie universitaire*; also manufactures of beer, brandy, woolen cloth, blankets, hosiery, chemical products, cotton fabrics, and pottery. Its prosperity is largely derived from the trade in Burgundy wines, flowers, and agricultural products. Pop. (1896) 67,736.

Dike, or **Dyke** [O. Eng. *dīc* (whence also with umlaut *ditch*): Germ. *Teich*, pond; Fr. *digue* is borrowed from Low Germ., cf. Dutch *dijk*]: in engineering, an embankment erected on the shore of a sea or river in order to prevent inundation. Such embankments raised along the Mississippi river are called levees. The coasts of Holland are protected against the encroachments of the sea by dikes constructed on a grand scale and in a systematic manner. A large part of that country is so low that it would be overflowed by the sea during high tides if it were not protected, partly by natural sandhills or dunes and partly by artificial dikes. The latter are also raised on the banks of the Rhine, Waal, and other rivers near their mouths. The dikes are broad at the base, and are usually of such magnitude that there is room on the top for a public road. The fabric is strengthened by willows, either growing or interwoven as wicker-work on the sides of the dike, which should present a very gradual slope toward the sea or river. The *Ammophila* and other creeping grasses are carefully cultivated on some of the dykes, and contribute much to their security. The base is often faced with masonry, and protected by vast heaps of stones (usually brought from Norway), and by rows of piles projecting 6 or 7 feet above ground, connected by timber, and filled in with fascines weighted with stones. The most stupendous of these embankments are the dikes of the Helder and of West Kappel, at the western extremity of the island of Walcheren. The term dike, as the equivalent of the Fr. *digue*, is applicable to BREAKWATERS, JETTIES (*qq. v.*), to the dams of Holland constructed for engineering purposes, the most remarkable of which is the work by which the Y is isolated from the Zuyder Zee (see CANAL), and also to that by which one of the outlets of the Maas has been obstructed.

Dike: in geology, a broad and relatively thin plate of igneous rock, originally introduced while molten into a fissure. Dikes are inclined at all angles to the horizon, but the greater number are approximately vertical. When inserted between the layers of a sedimentary formation, they are called intrusive sheets. Rocks traversed by dikes usually show alteration at and near the surface of contact, due to the heat of the injected liquid. As dikes are laid bare by erosion, their material often proves more resistant than the inclosing rock, in which case they project above the general level in wall-like ridges, whence their name. See ROCKS and VOLCANOES. G. K. G.

Dike, SAMUEL WARREN, LL. D.: minister; writer on economic and social questions; b. at Thompson, Conn., Feb. 13, 1839; graduated at Williams College 1863, and at Andover Theological Seminary 1866; held pastorates in the Congregational church 1868–82; corresponding secretary of the National Divorce Reform League 1881; assisted Carroll D. Wright in the preparation of his report on marriage and divorce in the U. S. and Europe; has prominently urged the study of sociology in educational institutions; author of numerous papers upon sociology and the marriage and divorce problem, which have been published in the *Political Science Quarterly*, *Century*, *Arena*, *Atlantic Monthly*, etc. C. H. THURBER.

Dilemma [Gr. δίλημμα, a double assumption, argument from a double assumption; δι-, two + λῆμμα, assumption, deriv. of λαβεῖν, take, assume]: a syllogism with a conditional premiss, used to prove the absurdity or falsity of some assertion. A conditional proposition is assumed, of which the antecedent is the assertion to be disproved, and the consequent is a disjunctive proposition setting forth the supposition on which the assertion can be true. If the supposition be denied, the assertion must also be denied. Thus, if A is B, either C is D or E is F; but C is not D, and E is not F; therefore A is not B. The dilemma was called the *syllogismus cornutus* (horned syllogism), the two members of the consequent being the "horns of the dilemma," on which the adversary is caught. Since there may be more than two horns to the dilemma (giving us a trilemma, tetralemma, or polylemma), Hamilton proposes the term hypothetica-disjunctive.

Dilettan'te [Ital. pres. ptc. of *dilettare* < Lat. *delecta're*, delight]: an Italian term naturalized in English, French, and German; originally synonymous with an *amateur* or lover of the fine arts. It is sometimes applied to a person who pursues an art without serious purpose or for mere amusement, and is often used as a term of reproach for one whose knowledge is superficial and affected. The plural is *dilettanti*. In 1734 the Society of the Dilettanti was established in Great Britain to encourage a taste for the fine arts. It sent an expedition to the East in 1764, and published in 1769 the first part of the *Ionian Antiquities*, the fourth part of which appeared in 1881. Chandler's *Travels in Asia Minor* appeared in 1775, and his *Travels in Greece* in 1776; the *Unedited Antiquities of Attica* in 1817, *Antique Sculpture* in 1835, and *Athenian Architecture* in 1851.

Diligence, dĕĕ'lĕĕ'zhääns' [Fr., with meaning developed through "attention," "speed," "expedition," "dispatch"]: a four-wheeled public vehicle used in Europe. The French diligence is very strongly built, and drawn by four or six horses at the rate of 6 miles an hour. The front, called the *coupé*, holds three persons, the second compartment (the *intérieur*) six, and the *rotonde*, entered from behind, also six. Diligences are also used in Germany, Italy, Spain, and Russia; the German diligence (*Eilwagen* and *Postwagen*) is attached to the post-office. Diligences are much less used than formerly, owing to the facilities of railway travel.

Dilke, Charles Wentworth: English critic and journalist; b. Dec. 8, 1789; educated at Cambridge, and served for twenty years in the navy pay office; edited *Old English Plays* (6 vols., 1814). He purchased in 1830 the *Athenæum*, which he edited with ability and success until 1846. He established the *Daily News*, a Liberal journal, in 1846, and edited it for three years. D. at Alice Holt, Hants, Aug. 10, 1864. See the collection of his contributions to newspapers and periodicals, with biographical sketch, entitled *The Papers of a Critic* (1875).

Dilke, Sir Charles Wentworth: politician; b. in Chelsea, England, Sept. 4, 1843; educated at Cambridge, and called to the bar in 1866. He traveled through the U. S., Australia, and India, and on his return published *Greater Britain, a Record of Travel in English-speaking Countries during 1866–67* (1868), which speedily passed through several editions, and procured the author's election to Parliament for Chelsea. He was re-elected in 1874, though violently opposed because in the meantime he had acknowledged himself a republican. In 1880 he was appointed under-secretary of state for foreign affairs, and in 1882 president of the local government board, with a seat in the cabinet. In 1884 he was appointed chairman of the Royal Commission on the Housing of the Working Classes, the other members being the Prince of Wales, Lord Salisbury, and Cardinal Manning. In 1886 he was defeated for Parliament, doubtless for having been the co-respondent in a divorce suit brought by Capt. Crawford. He was not again in public life until 1892, when, after a contest of much bitterness, he was returned to Parliament as a Liberal by the Forest of Dean, with a heavy majority. Up to his retirement in 1886 he had been regarded as a probable future leader of the Liberal party. He succeeded his father and grandfather as proprietor of the *Athenæum*, is proprietor of *Notes and Queries*, and one of the proprietors of the *Gardeners' Chronicle*. In addition to *Greater Britain*, he is the author of *The Present Position of European Politics* (1887); *The British Army* (1888); *Problems of Greater Britain* (1890); and several minor works, magazine and review articles. Revised by C. H. Thurber.

Dilke, Lady Emilia F. (*Strong*): English author; b. in 1842. She was married in 1862 to the Rev. Mark Pattison, and in 1885 to Sir Charles W. Dilke. She has contributed art criticisms to the *Academy*, and published *The Renaissance of Art in France* (1879); *Claude Lorrain, sa Vie et ses Œuvres* (Paris, 1879); *The Shrine of Death* (1886); and *Art in the Modern State* (1888). H. A. B.

Dill: any plant of the genus *Peucedanum* of the family *Umbelliferæ*. The most important of these is *Peucedanum graveolens* (formerly called *Anethum graveolens*), a weed-like annual plant of Southern Europe and Western Asia. Its oval-oblong flat fruits have a smooth brown surface and a membranous border. These fruits are aromatic, and constitute the dill-seed or dill of commerce, which are of some importance in pharmacy, where they are known under the name of "anethum." Medicinally they are stimulant, carminative, and stomachic. From them a pale-yellow, pungent oil used in making dill-water is obtained. C. E. B.

Dillen, Johann Jakob, M. D.: botanist; b. at Darmstadt, Germany, in 1687. In 1721 he removed to London, where he edited Ray's *Synopsis of Plants* (1724). He obtained in 1728 the chair of botany founded by Sherard at Oxford. He published *Hortus Elthamensis* (1732) and a good *History of Mosses* (1741). D. Apr. 2, 1747.

Dil'lingen: town of Bavaria; in the circle of Suabia; on the Danube, 24 miles N. W. of Augsburg (see map of German Empire, ref. 7–E). It is inclosed by old walls; has a palace, three Catholic churches, a gymnasium, and a Catholic institution for deaf and dumb girls, with which is also connected, since 1869, an institution for cretins. The university, which was established in 1554, and was a chief seat of the Jesuits, was suppressed in 1809. The town has also manufactures of cutlery. Pop. (1890) 5,791.

Dillmann, Christian Friedrich August: theologian and Orientalist; b. at Illingen, Würtemberg, Apr. 25, 1823; became Professor of Exegetical Theology at Tübingen in 1853; of Oriental languages at Kiel in 1854; of Exegetical Theology at Giessen in 1861; and at Berlin in 1869. He has distinguished himself by his works on the Ethiopic language, among the most important of which are *Grammatik der Æthiopischen Sprache* (1857); *Chrestomathia Æthiopica* (1866); *Lexicon linguæ Æthiopicæ* (3 parts, 1862–65); editions of the old Ethiopic version of the Bible (1855–73); of the apocryphal book of Enoch (1851); the book of Adam, the book of Jubilees, and the Ascension of Isaiah. He also wrote valuable commentaries on the Hexateuch, Isaiah, and Job, and was author of the article on the Ethiopic Language in the present work. D. July 4, 1894.
Revised by C. H. Toy.

Dillon: city; on Utah and Northern R. R., capital of Beaver Head co., Mon. (for location of county, see map of Montana, ref. 7–E). It is the seat of the State Normal School, is a trade center for a large stock-raising, agricultural and mining region, is lighted by electric lights, and has a national bank and two weekly newspapers. Pop. (1890) 1,012; (1900) 1,530. Editor of "Tribune."

Dillon, John, M. P.: Irish politician; b. 1851; son of an Irish agitator, John Blake Dillon, who was obliged to flee in 1848 to America; educated at the University of Dublin; studied medicine; elected to Parliament for Tipperary 1880; suspended Feb. 2, 1881, the first of the Parnellite party to be so treated; again elected to Parliament 1885–86–92; several times arrested for political causes; one of the most prominent leaders of the Irish national movement.

Dillon, John F.: See the Appendix.

Dillon, Wentworth: See Roscommon, Earl of.

Dilman, deel-maan': town of Persia; province of Azerbijan; 50 miles N. N. W. of Urumiya (see map of Persia and Arabia, ref. 1–E); about 4 miles E. of an old ruined town of the same name. It is surrounded by gardens and orchards, and is described as a neat and healthful place, with some trade and manufacturing industry. Pop. 6,000.

Dilolo, Lake: See the Appendix.

Dilu'vium: a Latin word signifying deluge; applied by the older geologists to certain gravels and comparatively recent deposits which appear to be the result of a deluge, in order to distinguish them from the fine sand and mud which is washed down by rivers, and is called alluvium. Those deposits are now known to have been formed through the agency of glaciers in the pleistocene period. See Drift.

Di'man, Jeremiah Lewis, D. D.: clergyman; b. at Bristol, R. I., May 1, 1831; graduated at Brown University, 1851, and at Andover Theological Seminary, 1856, spending in the meantime two years in study abroad. He was settled over the First Congregational church in Fall River, Mass., in 1856, and over the Harvard church in Brookline, Mass., in 1860. In 1864 he became Professor of History and Political Economy in Brown University. He published numerous addresses and articles in the leading reviews, and was an accomplished scholar and orator. D. in Providence, R. I., Feb. 3, 1881. Published posthumously *The Theistic Argument* (Boston, 1881); *Orations and Essays* (1881). His *Life* was written by Caroline Hazard (Boston, 1887).
Revised by George P. Fisher.

Dime [O. Fr. *disme* < Lat. *de'cimus*, tenth]: a silver coin of the U. S. equivalent to ten cents or one-tenth of a dollar. It was formerly written *disme*.

Dimension [from Lat. *dimen'sio*, deriv. of *dimeti'ri*, measure off]: in mathematics, the capacity of extension to be measured in some direction. In geometry, a point has no dimensions; a line, whether straight or curved, has one dimension—namely, length; a surface has two—length and breadth; and a solid has three dimensions—length, breadth, and thickness. As the latter is the most general form of extension, space is of three dimensions. Space of four dimensions, an expression used by some mathematicians, is simply an algebraic term.

Diminution [from Lat. *diminu'ere*, make small; *de*, off + *minus*, less]: the act of making or becoming less; decrease; in architecture, the gradual decrease in the diameter of a column from the base to the upper end. In heraldry, the word diminutions is sometimes used for differences, marks of cadency, and brisures indifferently.

Diminutive [from Lat. *diminuti'vus*, deriv. of *diminuere*, lessen, make smaller]: in grammar, a derivative which softens the meaning of its primitive, or expresses a young or a small object of the same kind as its primitive; thus *animalcule* (Lat. *animalculum*) to *animal*. The principal diminutive suffixes in English are: *-et*, *-let*, *-cle*, *-cule*, *-kin*, *-ling*, *-ock*, *-in*, *-y*, *-ie*; cf. *versicle*, *particle*, *islet*, *coronet*, *leaflet*, *lambkin*, *manikin*, *duckling*, *gosling*, *darling*, *bullock*, *hillock*, *hammock*; compare Latin *filiolus*, little son, with *filius*, son, *homunculus*, little man, with *homo*, man, *regulus*, prince, with *rex*, king; so Fr. *maisonette*, little house, with *maison*, house; Germ. *mädchen*, with *magd*, etc.

Dimity [viâ Mediæv. Lat. from Gr. δίμιτος, of double thread; δι-, two + μίτος, thread]: a cotton fabric of thick texture, and generally figured or striped. It was formerly much used for bed-hangings and window-curtains. Originally, dimity was commonly white, or, at least, of one uniform color, but now they are made of different colors. The cloth is made with a woven pattern and a plain band alternating, and a colored pattern is printed on the latter.

Dimorphism [from Gr. δίμορφος, of double form; δι-, two + μορφή, form]: in biology, the occurrence of individuals of the same species under two distinct forms, which, were not the connection known, would be regarded as distinct species or even as distinct genera. In many cases the dimorphism is sexual, the male and female presenting entirely different characters. Thus in the canker-worm moth the male is winged, the female lacks the wings. In other cases differences may be seen among the individuals of the same sex. Thus in a South American Isopod (*Tanais*) there occur two types of males, one stronger and with strong pincers for clasping the female, the other weaker, with a differently shaped pincer, and with abundant smelling hairs. For other instances, see POLYMORPHISM. J. S. K.

Dimorphism: in crystallography, the capacity of a substance to crystallize in two distinct forms. Carbon, sulphur, and calcium carbonate are examples. Sulphur when obtained by evaporation from its solution in carbon bisulphide crystallizes in octahedra, but sulphur melted by heat on cooling forms prismatic crystals. The latter have a tendency to break up into octahedra, but these when heated form smaller prismatic crystals. Carbon, as the diamond, crystallizes in octahedra and allied forms, but as graphite it forms hexagonal crystals.

Dimsdale, THOMAS: physician; b. at Thoydon-Garnon, England, 1712: practiced in Hertford, and became famous for his inoculation for the smallpox. In 1768 he was summoned by Catherine the Great of Russia to inoculate herself and her son, and for his services was rewarded with a title and a pension of £500 per annum. Returning to England he published a treatise on *Inoculation* (1796), and afterward became a member of Parliament for Hertford. D. in Hertford, Dec. 30, 1800.

Dinaburg: same as DÜNABURG (*q. v.*).

Dinajpur, dĕĕ-năăj-poor': district in the northeastern part (Rajshahi division) of Bengal, British India; area, 4,118 sq. miles. The surface is nearly level, and the climate is unhealthful. Rice is the staple product of the soil. The population is chiefly of aboriginal descent. Pop. 1,525,000. The capital of the district is Dinajpur, 221 miles N. of Calcutta, on the Purnabhaba river (see map of N. India, ref. 6–I). It is meanly built, and its trade is inconsiderable. Pop. 12,560.

Dinan, dĕĕ'năăn': an old town of France; department of Côtes-du-Nord; on the river Rance, 30 miles N. W. of Rennes (see map of France, ref. 4–C). It stands on a hill of granite about 250 feet above the river, is inclosed by walls and defended by a castle. It has a handsome cathedral, a public library, a college, and a town-hall. Here are manufactures of linen and cotton fabrics, sailcloth, hats, beet-root sugar, etc. The Rance is navigable from its mouth to Dinan. Pop. (1896) 10,620.

Dinant' [in Fr. pron. dĕĕ'năăn', Lat. *Dinantium*]: town of Belgium; province of Namur: on the river Meuse; 15 miles S. of Namur (see map of Holland and Belgium, ref. 12–F). It is on the declivity of a rocky hill, and is surrounded by picturesque scenery. It has a Gothic cathedral, a town-house, two hospitals, and manufactures of cutlery, paper, woolen goods, hats, and leather. Dinant was founded in the sixth century, was strongly fortified as early as the twelfth century, and has suffered much from sieges. Pop. (1891) 7,048.

Dinapur, dĕĕ-năă-poor': town and important military station of British India; province of Bengal; on the right bank of the Ganges, about 12 miles above Patna (see map of N. India, ref. 6–H). Here are spacious barracks, and about 3,200 houses, mostly of mud.

Dinar'chus (Δείναρχος): one of the ten Attic orators; a native of Corinth who came to Athens about 342 B. C. and took up the profession of a composer of speeches. He rose to influence under Demetrius Phalereus, and fell with him in 307. After spending fifteen years in exile at Chalcis in Euboea, he was allowed to return, but it was only to die in penury and almost total blindness. Though a virulent opponent of Demosthenes, against whom his principal extant oration is directed, he imitated the great orator in a rough way, and hence was called a "barleybread Demosthenes" (κρίθινος Δημοσθένης). This imitation is evident in the three speeches extant, all pertaining to the miserable affair of HARPALUS (*q. v.*). Edited with elaborate commentary by Mätzner (1842); critical edition by Thalheim (1887). See Blass's *Attische Beredsamkeit*, vol. iii. (B), pp. 236–247.

Dinar'ic Alps (in Lat. *Alpes Dinaricæ*): the name given to the range of mountains connecting the Julian Alps with the western ranges of the Balkan. It divides Dalmatia from Bosnia and Herzegovina, and a spur extends into Dalmatia. The highest summits are Mt. Orjen and Mt. Dinara, the former of which rises about 6,225 feet above the sea. The rocks of this range are mostly limestone.

Din'dorf, WILHELM: philologist; b. in Leipzig, Saxony, Jan. 2, 1802; became Professor of History and Literature there in 1828, but resigned in 1833 in order to devote himself to the publication of a new edition of the *Thesaurus* of Stephanus, which his brother Ludwig Dindorf and Hase had begun in Paris. Along with this he prepared critical editions of very many classical authors; among them, an edition of Demosthenes for the University of Oxford (1849), and editions of Æschylus, Sophocles, Euripides, and Aristophanes, to which were added commentaries, and a work on the meters of the same poets; later he compiled a *Lexicon Sophocleum* and a *Lexicon Æschyleum*. D. Aug. 1, 1883. See *Biogr. Jahrbuch*, vi. (1883), pp. 112–121.

Revised by A. GUDEMAN.

Dingdings, The: a part of the Straits Settlement colony (British) on the west coast of the Malay Peninsula. It consists of the island of Pangkor, with a small strip of the coast of Perak. It is about 30 miles S. of Penang.

Ding'elstedt, FRANZ, von: German poet; b. at Halsdorf, in Hesse, Jan. 30, 1814; appointed librarian to the king at Stuttgart in 1843; intendant of the royal theater of Munich in 1850; an intendant of the Weimer theater in 1859; director of the court opera at Vienna in 1867; and director of the Burgtheater of Vienna in 1871. Author of *Lieder eines kosmopolitischen Nachtwächters* (Songs of a Cosmopolitan Nightwatch, 1841); the tragedy *Das Haus der Barneveldt* (The House of Barneveldt, 1850); *Nacht und Morgen* (Night and Morning, a collection of poems, 1850); several novels, mostly humorous, sketches of travel, etc. His translations of Shakspeare's works, especially the historical dramas, became famous on the German stage. D. May 17, 1881.

Dingley, NELSON: See the Appendix.

Dingo (the native Australian name): a species of dog (*Canis dingo*) inhabiting Australia. It is somewhat larger than a shepherd's dog, of a tawny color, with erect ears and a bushy tail. The dingo is extremely fierce, and being very destructive to sheep, its numbers have been greatly lessened by the efforts of the colonists. In its wild state the dingo does not bark, but learns to do so in captivity. It is re-

markable for being the only dog living both in a wild and in a domesticated state, and also from the fact that it is the sole large terrestrial mammal not a marsupial found in Australia. From its striking contrast to the other Australian mammals it would seem that the dingo could scarcely have reached Australia without the aid of man, and yet its remains are found fossil in pliocene tertiary deposits. F. A. Lucas.

Dinich'thys [from Gr. δεινός, terrible + ἰχθύς, fish]: a genus of placoderm fishes, attaining a length of 15 feet and upward, whose remains are found in the lower Carboniferous of Ohio. The cranium was very massive; the anterior part of the body protected by bony plates, the principal dorsal shield sometimes having a diameter of 2 feet. No scales have been found, and the hinder portion of the body was probably covered with rough skin. The mouth was large, the lower jaw of some species being 2 feet in length. There were two large triangular teeth in front, above and below, and back of these a few small pointed teeth. The dentition is remarkable from the fact that these teeth were formed by projections of the jaw-bone. Revised by F. A. Lucas.

Dinka, or **Denka**: a people inhabiting about 60,000 sq. miles W. of the White Nile, and between 6° and 9° N. lat. They belong to the darkest of negro races, are clean in their persons and in what they eat, give all their attention to cattle-raising, and possess immense herds. Their principal weapon is the lance. The men dispense entirely with clothing, but the women are well dressed. Though their tribes fight one another, their union against the Arab slavers has prevented the Khartoum raiders from getting a foothold on their soil. See Schweinfurth's *Heart of Africa*. C. C. Adams.

Dinkelsbühl, ding'kels-bül: a walled town of Bavaria; on the river Wernitz, 44 miles S. W. of Nuremberg; formerly a free city of the empire (see map of German Empire, ref. 6–E). It has a Latin school and various manufactures. Pop. (1890) 4,484.

Dinoceras: See Tinoceras.

Dino Compagni, dee'nō kōm-paan'yee: Italian magistrate, and author of a valuable history of Florence comprising the period 1280 to 1312; became prior and gonfalonier of justice. Though of noble birth, he supported the democratic cause. D. at Florence, Feb. 26, 1323.

Di'nomys [from Gr. δεινός, terrible + μῦς, a mouse]: the only genus of the *Dinomyidæ*, a family of rodents based on a single specimen of a mammal from Peru, named *Dinomys branickii* by Prof. Peters. The body is about 2 feet and the bushy tail 9 inches in length; the hair is harsh, the color grizzly gray marked with two white stripes and numerous white spots on the back and head; there are four toes on each foot. The animal, which bears a strong resemblance to a paca with a bushy tail, combines characters of the agoutis, pacas, and chinchillas. F. A. Lucas.

Dinor'nis [from Gr. δεινός, terrible + ὄρνις, bird]: the typical genus of the family *Dinornithidæ*; a group of extinct birds, known as moas, whose remains occur abundantly in the most recent deposits of New Zealand. By some authors the Moas are regarded as forming an order by themselves, but they are usually considered as a family of the order *Struthiones* and placed near the cassowaries, these birds and the kiwis (*Apteryx*) being their nearest living relatives. Capt. Hutton divides the birds, once united in the single genus *Dinornis*, into seven genera and twenty-six species, ranging in size from a turkey to a bulk exceeding that of an ostrich. The Moas were much more massive in their structure than any existing birds, the leg bones in particular being extremely strong and heavy, *Dinornis elephantopus* taking the lead in this respect, although not the largest species. All were incapable of flight, and in some species not even the rudiments of a wing were present. The head of these birds was small in proportion to their bulk, and indicates them to have been sluggish and stupid. *Dinornis maximus*, one of the best-known members of the group, was about 9 feet high when standing erect, but could easily have reached 2 or 3 feet higher. The tibia of this bird was 34 inches long, the combined length of femur, tibia, and tarsus being nearly 6 feet. Differences of opinion exist as to the date at which these gigantic birds became extinct, but there is good reason to believe that some were in existence within the last 300 years, possibly even at the time of the discovery of New Zealand.

Dinornis (restored).

Their remains occur in caves, in fissures caused by earthquakes and enlarged by the action of water, in swamps, and in some localities bones are plowed up in bringing land under cultivation. The best skeletons have been obtained from narrow fissures, into which birds had fallen and died, the specimens plowed up being always imperfect, and often bearing evidence showing that the missing portions had been cut off by man. The ultimate extinction of the Moas was brought about by man, who feasted on their flesh and eggs, but it is thought that the beginning of their decrease was due to increasing severity of climate.

A most interesting deposit of bones was found in a swamp, or lagoon, fed by springs, in which the Moas are believed to have sought refuge from the cold. No less than 7 tons of bones, representing at least 400 individuals, were taken from this spot, intermixed with a great quantity of quartz pebbles from their crops. Feathers, fragments of skin, and bones with dried tendons attached have been discovered in caves, and a very few eggs have been found, principally in graves. The largest egg measures 10 by 7 inches, not especially large for the bulk of the bird, and far inferior in size to the egg of the extinct *Æpyornis* of Madagascar. A few remains assigned to *Dinornis* and to a nearly related bird, *Dromornis*, have been discovered in Queensland, Australia.
F. A. Lucas.

Dinosau'ria [from Gr. δεινός, terrible + σαῦρος, lizard]: an order of extinct reptiles related to the crocodiles on the one hand and the birds on the other, containing the largest land reptiles and many which often, or habitually, walked on their hind legs. The smallest species were not more than 3 feet long, while the largest attained a length of 60 feet. See Vertebrates, Fossil. F. A. L.

Dinothe'rium [from Gr. δεινός, terrible + θηρίον, wild animal]: a genus of extinct mammals related to the mastodon and elephant, but having no tusks in the upper jaw, and two tusks projecting downward and slightly backward from the lower jaw. The skull is broad and flattened, and there are two premolars and three molars on either side of each jaw. The first molar has three ∧-shaped cross ridges, the other teeth two. Remains of the *Dinotherium* occur in the Middle and Upper Miocene of Germany, France, Greece, Asia Minor, and India. The skull first discovered was not associated with limb bones, and the animal was supposed to have been aquatic and allied to the manatee. Limb bones have since been found, among them a femur nearly 6 feet long, and *Dinotherium* is now regarded as a proboscidean. F. A. L.

Dio, or **Dion** (surnamed Chrysostomus, "Gold Mouth," on account of his eloquence): Greek rhetorician and philosopher; b. at Prusa, in Bithynia, about 50 B. C. Honored by Vespasian, he was banished from Rome by Domitian, but recalled by his patron Nerva, and favored by Trajan. He traveled much after the fashion of the times, and to these travels we owe interesting glimpses of the life of the empire. Dio is not exempt from the unreality of his age, but the thought is deeper, the moral conviction more thorough, than we find in the mere "sophist" or "rhetorician" of the Greek Renaissance, and his orations or, better, "essays" are something more than rhetorical exercises. His style is clear and fluent, he is a good story-teller, and his Atticism, though not the success it was once held to be, is more than respectable. Best ed. by Emperius 1844, text with valuable introduction by L. Dindorf in the Teubner series. See Schmid, *Atticismus*, i., 141 foll., and Hertzberg, *Geschichte Griechenlands unter der Herrschaft der Römer*, vol. ii., pp. 186–188. B. L. Gildersleeve.

Di'o Cas'sius: the most important Greek historian of the imperial period; grandson of Dio Chrysostomus; b. at

Nicæa, in Bithynia, 155 A. D. He rose to high position and was twice consul. Of his great *History of Rome*, in eighty books, from the landing of Æneas to the accession of Alexander Severus and Dio's consulship of 229, books 36–60 from 68 B. C. to 47 A. D. are extant, mutilated in parts, the rest only in fragments and in excerpts. Dio Cassius is our most important source for the period of which he treats, and he is a vivid and interesting writer, showing the soldier and the man of affairs at every turn. But he repels by his groveling superstition, and his groveling self-abasement before the imperial power. His model of style is Thucydides, whom he imitates so closely that his text is often appealed to by the commentators of his great original. Ed. by Bekker (1849), and Dindorf (1863–65). D. about 235.

B. L. GILDERSLEEVE.

Diocese [O. Fr. *diocise* (> Mod. Fr. *diocèse*): Ital. *diocesi* < Lat. *diœce'sis*, district, province = Gr. διοίκησις, management, province, deriv. of διοικεῖν, manage, administer; διά, through + οἰκεῖν, inhabit, hold, manage, deriv. of οἶκος, house]: the district under the ecclesiastical jurisdiction of a BISHOP (*q. v.*); belonged originally to the civil hierarchy. Under Constantine the Great the Roman empire was divided into thirteen civil territories called dioceses, which were again subdivided into 120 provinces. These dioceses were governed either by prefects, proconsuls, or vicars, and the provinces by rectors. The word gradually acquired an ecclesiastical use; but its meaning varied. In the Western Church by the end of the fourth century it meant what is now meant by it. In the East it meant a patriarchate equivalent to what is now known as a province with suffragan sees. Revised by J. J. KEANE.

Dioele'tian (Lat. *Diocletianus*), or, more fully, **Cains Valerius Aurelius Diocletianus**: a Roman emperor; b. in Dalmatia, in 245 A. D., of humble parentage. He served with distinction in the army under Aurelian and Probus. On the death of Numerianus, in 284, he was proclaimed emperor by the army at Chalcedon, and after a brief war in Moesia, in which his rival Carinus was killed, he was installed at Nicomedia. In the year 286 he adopted Maximian as his colleague in the empire, which was disturbed by incursions of barbarians and menaced by the Persians. They suppressed revolts in Gaul, and, in order to divide the labor of ruling so vast an empire, chose Galerius and Constantius Chlorus as their assistants in 292 A. D., and gave them the title of cæsar. This was the beginning of the division of the empire into Eastern and Western. Diocletian reserved to himself Asia and Egypt; Maximian received power over Italy and Africa; Thrace and Illyricum were assigned to Galerius; and Gaul and Spain to Constantius Chlorus. The supremacy of Diocletian (whose court was at Nicomedia) was acknowledged by the other three. After this distribution of power the Roman armies gained successes in Egypt, Persia, and Britain. Diocletian protected or omitted to persecute the Christians until 303 A. D., when a persecution was commenced at the instigation of Galerius. Diocletian abdicated the throne in 305 A. D., in favor of Galerius, and retired to Salona, in Dalmatia, where he devoted his time to horticulture. The immense palace which he built at Salona marks a great change in architecture from the pure classic Græco-Roman style to the earliest Romanesque. This palace is the subject of an excellent book by R. Adam, published in 1764, and one of the earliest attempts at a true archæological treatment. The modern town of Spalato is almost wholly contained within the walls of this palace. D. in 313 A. D. See Gibbon, *Decline and Fall of the Roman Empire*; Tillemont, *Histoire des Empereurs*; Vogel, *Der Kaiser Diocletian* (1857).

Dioeletian Era (called also the **Era of Martyrs**, on account of the persecution in Diocletian's reign): the period in the early Christian chronology dating from the year 284 A. D., the year of the proclamation of Diocletian as emperor. The term was employed till the method of reckoning time from the birth of Christ was introduced by DIONYSIUS EXIGUUS (*q. v.*) early in the sixth century, and is still used by the Abyssinians and Copts.

Dioda'ti, GIOVANNI: Calvinistic theologian; b. of an Italian family at Geneva, Switzerland, June 6, 1576; appointed Professor of Hebrew at his native place in 1597; became Professor of Theology there in 1609, resigning in 1645. In 1618 he represented the Church of Geneva in the Synod of Dort, where his reputation was so high that he was one of the persons appointed to write the articles of faith. He produced the still most widely circulated Italian (Geneva, 1607) and French (1644) translations of the Bible, and wrote several treatises against the doctrines of the Roman Catholic Church. D. in Geneva, Oct. 3, 1649. See his *Life* in French by E. de Budé (Geneva, 1869).

Di'odon [from Gr. δι-, two, double + ὀδούς, ὀδών, tooth]: a genus of marine fishes of the order *Plectognathi*, without distinct teeth, but having the jaws covered with an ivory-like substance, which is formed by the blending of the teeth into one. Some of them have the power of filling their stomachs with air and assuming a globular form, whence they are called globefish; others are designated porcupine-fish from their numerous spines, which stand out like those of a hedge-hog. Most of the diodons of the Atlantic waters of the U. S. are called balloon-fish. They are of several species.

Diodo'rus Sic'ulus: Greek historian; b. at Agyrium, in Sicily; flourished about 50–20 B. C. He traveled in Europe and Asia in order to collect materials for a universal history, and afterward became a resident of Rome. He expended many years in the composition of his history, which is entitled *Historical Library* (Βιβλιοθήκη ἱστορική), in forty books. It is a history of the world from the earliest times to 60 B. C. The name describes it fitly. It is a collection of books in abridged editions, the facts of the greatest interest and importance, the authorities often a matter of dispute. The librarian lacks knowledge of the world, critical faculty, vision, and sense of proportion. The annalistic arrangement is unhappy and the style, though clear and simple except where it rises by a spasmodic rhetorical effort, has little movement and is wearisome by its repetition of set phrases. Fifteen entire books of his work, and some fragments of the others, are extant. Among the best editions are those by Bekker (4 vols., 1853–54) and by L. Dindorf (5 vols., 1867–68). Revised by B. L. GILDERSLEEVE.

Diog'enes (in Gr. Διογένης): a famous Cynic philosopher; b. at Sinope, in Asia Minor, about 412 B. C. He was a pupil of Antisthenes, who declared that it was god-like not to need anything. Accepting this principle, Diogenes inured himself to extreme privations; his house was a tub, his wealth a cloak, a wallet, a staff, and a wooden cup, and this he threw away on seeing a lad drink from the hollow of his hand. He was a severe and caustic censor of the follies and vices of the Athenians, who allowed him a great latitude of comment and reproof. He was renowned for his witty and sarcastic sayings. He once received a visit from Alexander the Great, who inquired, "What can I do for you?" Diogenes replied, "Cease to stand between me and the sun." Having been captured by pirates, who offered him for sale in a slave-market of Crete, he cried, "Who wants a master? The man who buys me must obey me as masters obey their physicians." He was purchased by Xeniades, a citizen of Corinth, who was a kind master, and soon liberated him and employed him as a tutor of his children. D. about 323 B. C. See Ritter, *History of Philosophy*; Grimaldi, *Vita di Diogene Cynico* (1777).

Diogenes Laertius (in Gr. Διογένης ὁ Λαέρτιος): the name attached to a kind of scrap-book labeled *Lives and Doctrines of Famous Philosophers*. Of Diogenes himself we know absolutely nothing. The work contains important information, interesting anecdotes, and priceless extracts from lost works, all put together in the most mechanical way. See Usener's *Epicurea*, introduction. The standard edition is still that of Hübner (4 vols., 1828–33). B. L. G.

Diogenes of Apollonia: an ancient Greek philosopher; b. in Crete; lived about 470 B. C.; a disciple of Anaximenes, and taught philosophy at Athens. He regarded air as the first principle of all things, and wrote a work on nature or cosmology, which is not extant.

Diogenia'nus: Greek grammarian of Heraclea; flourished about the middle of the second century A. D. From him was derived the mass of what is found in the lexicon of Hesychius. His name appears also as one of the collectors of Greek proverbs on *Paroemiographi Græci*, ed. by von Leutsch and Schneidewin, i., pp. 177–320. B. L. G.

Diomedea: See ALBATROSS.

Di'omede Islands: a group of three small islands in the middle of Bering's Strait, midway between Asia and America.

Diome'des, often anglicized **Di'omede** or **Di'omed** (in Gr. Διομήδης): a Greek warrior and King of Argos, celebrated in the ancient legends as a son of Tydeus (hence he was

called Tydides), and a favorite of Minerva. He fought with distinction at the siege of Troy, and, according to Homer, ventured to attack Mars, who defended the Trojans. Diomedes and Ulysses are said to have carried away the Palladium of Troy. Some writers relate that after the capture of Troy he settled in Italy.

Diomedes: a king of the Bistones in Thrace; fabled to have fed his horses on human flesh. He was slain by Hercules.

Diomedes: Latin grammarian of the fourth century. His treatise on grammar in three books has considerable value, having incorporated much from earlier writers of authority now lost. It is printed in the first volume of Keil's edition of the *Grammatici Latini*. M. W.

Di'on (in Gr. Δίων): statesman of Syracuse; b. about 410 B. C.; inherited an ample fortune from his father. He acquired great influence at the court of Dionysius the Elder, who had married Aristomache, a sister of Dion. He was a pupil and intimate friend of Plato, who taught at Syracuse. After the accession of Dionysius the Younger (*q. v.*), Dion persuaded him to invite Plato to return to Syracuse. The virtue and austere morals of Dion rendered him obnoxious to the dissolute tyrant and his courtiers. He was banished, and took refuge at Athens, leaving at Syracuse his wife Arete, who was compelled to marry another man. In order to revenge himself and liberate his country, he raised a small body of troops in 357 B. C., and attacked Syracuse, which he occupied without much resistance. He expelled Dionysius, but was soon deprived of power by the intrigues of Heraclides. Dion was recalled by the people, but was assassinated by Calippus about 354 B. C. See *Life of Dion*, by Plutarch, who compares him to Marcus Brutus; Cornelius Nepos, *Dion.*

Dion: See Dio.

Dionæ'a [a name of Venus]: a genus of insectivorous plants of the family *Droseraceæ*. But one species is known, the *D. muscipula*, or Venus's flytrap, which grows upon the moist sandy land near Wilmington, N. C. It is a low perennial herb, having a rosette of peculiarly shaped leaves which lie flat upon the ground. Each leaf has a broad wedge-shaped petiole and a nearly round blade. The margins of the blade are fringed with bristly hairs, while the surface bears three sensitive hairs upon each side of the midrib. When the sensitive hairs are touched by a fly the two halves of the blade spring up suddenly and inclose it, the marginal hairs overlapping so as to imprison still more securely the unfortunate insect. Very soon an acid exudation from the leaf surface incloses the insect and dissolves its soft parts. Still later the solution is absorbed, leaving nothing but the empty shell and hard parts of the insect's body, when the leaf opens and is now ready for the capture of another insect. The plant has been grown in conservatories, and has been much studied by many botanists. For a further discussion, see the article Insectivorous Plants and the writings of Gray and Darwin, who gave the plant much attention. C. E. B.

Dionæa: Venus's flytrap.

Dion Cassius: See Dio Cassius.

Dionne, Narcisse E.: See the Appendix.

Dionys'ia (in Gr. Διονύσια): great annual festivals in honor of Dionysus (Bacchus); said to have been introduced into Greece from Egypt in 1415 B. C. They were of four kinds—the rural or lesser, the Lenæan, the Anthesterian, and the great Dionysia. They were chiefly celebrated at Athens. See Bacchanalia.

Dionys'ius, Saint: called The Great; the most distinguished convert and disciple of Origen; b. in Alexandria; became Origen's assistant in the catechetical school in 233; bishop of Alexandria in 248 A. D.; was driven out of that city by severe persecution in 250. In 257 A. D. the persecution was renewed, and Dionysius was banished to Libya, but he was restored in the year 260. He occupied a moderate position amid the controversies of his time, opposing the Sabellians, and gently urging the Novatians to be gentle with the lapsed. He denied the Apostolic origin of the Revelation, attributing it to the Presbyter John. He wrote many letters and religious treatises, which are not extant, except in fragments, which are found in Migne, *Pat. Gr. X.*, and in English translation by S. D. F. Salmond, in the New York edition of the *Ante-Nicene Fathers*, vol. vi., 77–120. See the monograph on him by Franz Dittrich (Freiburg im Br., 1867), and by Paul Morize (Paris, 1881). D. in 265 A. D. His day in the Greek Church is Oct. 3; in the Latin Church Nov. 17.

Dionysius Exig'uus: a learned monk; b. in Scythia; was a friend of Cassiodorus. He lived at Rome, and brought out an enlarged and revised Latin translation of a collection of apostolical canons and decisions of councils, which laid the foundation of canon law. He was the first who dated the Christian era from the birth of Christ, and unfortunately made it four years too late, so that the common chronology which was derived from him is wrong. His name Exiguus, "the little," refers either to his small stature or to his lowliness of mind. D. about 556. See his works in Migne, *Pat. Lat. LXVII.*

Dionysius of Halicarnassus (in Gr. Διονύσιος ὁ Ἁλικαρνασεύς): Greek rhetorician and historian; b. at Halicarnassus in Caria; went to Rome under Augustus, and passed more than twenty years in the study of Latin and in the composition of a Greek history of Rome, his *Roman Antiquities* (Ῥωμαϊκὴ ἀρχαιολογία) in twenty books, of which we have eleven and fragments. The theme was selected for its rhetorical opportunities. "History," he says, "is philosophy teaching by example," and the speeches are introduced to point the lessons of events and to display the resources of the writer's art. Of the period which he undertook to represent he had no vision. The sturdy Romans of the early republic became loquacious Greeklings of the early empire. Niebuhr was the first to assail the authority of Dionysius, which he demolished, but Dionysius used good sources, and can not be neglected. As a literary critic, Dionysius is more satisfactory than as a historian, and although he is narrow in his judgment of larger matters, in all that pertains to oratorical style he is an invaluable guide. Under Roman influence he became a passionate partisan of the Attic against the Asiatic school of rhetoric, and Demosthenes was his canon of excellence. His own style is fluent, and abounds in happy turns. D. after 8 A. D. Ed. of all the works by Reiske (1774); of the *Antiquities* by Kiessling in the Teubner series (1860–70), and by Jacoby (1885). Valuable edition of the *De Compositione*, by Schaefer (1808), of the treatises on Thucydides by Krüger (1823); specimen of a critical edition by Usener, *De Imitatione* (1889). See Blass, *De Dionysii Halicarnassensis scriptis rhetoricis* (1863).

B. L. Gildersleeve.

Dionysius Periege'tes: Greek geographer; author of a *Description of the Earth* in 1,187 hexameters. He flourished under Hadrian, and his poem became the great school geography. It was often translated into Latin, e. g. by Avienus and Priscian, and copiously commented. Ed. by Bernhardy with commentary, 1820; also in Müller, *Geographi Græci Minores*, vol. ii., 103–452. B. L. G.

Dionysius the Areop'agite: mentioned in the Acts of the Apostles (chap. xvii. 34) as one of the persons converted at Athens by the Apostle Paul. He is supposed to have been a member of the court of the Areopagus when Paul appeared before that tribunal. According to an early tradition, he was the first Bishop of Athens, and, according to a later tradition, suffered martyrdom there. In France he has been confounded with the Dionysius who went as missionary bishop to Paris about the middle of the third century, and who is commonly called St. Denys. The spurious mystical writings which bear his name, and which had permanent influence in developing Roman Catholic mystical theology, attempt to unite Neoplatonic ideas with those distinctively Christian. They appear to have had their origin in Alexandria during the fifth century. In the ninth century they were brought into Western Europe, and translated into Latin by Scotus Erigena. They are found in Migne, *Pat. Græc. III., IV.*; Scotus's version in *Pat. Lat. CXXII.* There is a French translation by J. Dulac (Paris, 1865). Cf. the treatise by C. M. Schneider (Regensburg, 1884.)

Dionysius (Gr. Διονύσιος) **the Elder**: tyrant of Syracuse; b. about 430 B. C. He was in his youth an obscure private citizen, and became a general in the service of the republic of Syracuse when Sicily was invaded by the Carthaginians. In the year 405 he usurped the supreme power in Syracuse, which then ceased to be a republic. He suppressed several insurrections of his subjects, and in 397 B. C. began or renewed hostilities against the Carthaginians, who then held some towns in Sicily. His fleet was defeated by the Carthaginians, who besieged Syracuse, but their success was hindered by a pestilence, and Dionysius gained a decisive victory over them after they had lost great numbers by disease. He also captured several towns in Sicily, and made conquests on the Italian peninsula. He was an able ruler, displayed superior political talents, and was one of the most powerful princes of his time. At the request of Dion he invited Plato to his court, but the lectures of that philosopher offended the tyrant, who ordered the captain of a ship to take Plato away and sell him as a slave. He was ambitious of literary fame, and wrote poems and tragedies, some of which he sent to the Olympic games, but he failed to obtain a prize. It is stated that in the latter part of his life he was very suspicious, and took many precautions against the traitors and conspirators who (he imagined) intended to kill him, and there are many stories told of his craft and cruelty as a tyrant, as, for example, that of the so-called Ear of Dionysius, a cave hewn in the rock, and communicating with his room, from which he could hear all that was said by his victims in the adjoining prison; but these traditions are doubtless exaggerated. D. in 367 B. C., and was succeeded by his son Dionysius. See Grote, *History of Greece*, part ii., chaps. lxxxi.–lxxxiii.; Holm, *Geschichte Siciliens*, ii., 92 foll.

Dionysius the Younger: tyrant of Syracuse; son of Dionysius the elder, whom he succeeded in 367 B. C. He was indolent, dissolute, and inferior to his father in political talents. He was persuaded by Dion (*q. v.*) to invite Plato to his court, but the eloquence and wisdom of that philosopher were unavailing to reform him. Dionysius banished Dion, who in 357 B. C. returned with a small army and expelled the tyrant. The latter fled to Locri, and became the despotic ruler of that city. He recovered power in Syracuse about the year 346, soon after which the oppressed Syracusans applied for aid to the Corinthians, who sent Timoleon with an army in 344 B. C. Dionysius was then deposed, and went as an exile to Corinth, where he is said to have taught school.

Dionysius Thrax, or **the Thracian**: disciple of Aristarchus; composed about 100 B. C. the first Greek grammar (τέχνη γραμματική), a famous compendium, which was made the basis of grammatical study, and has come down, according to the judgment of well-qualified scholars, substantially in its original form. Ed. by Bekker in his *Anecdota Græca*.

Dionysus: See Bacchus.

Diophan'tine Analysis [so called from Diophantus (*q. v.*)]: a branch of algebra not reducible to systematic rule, which treats of indeterminate problems, principally such as involve square or cube numbers, or the relations of the parts of right-angled triangles; and in which integral or commensurable values are found for the indeterminates by means of artifices suggested by the nature or conditions of the problems themselves. The subject is now generally included in the theory of numbers.

Diophan'tus (in Gr. Διόφαντος): Greek mathematician; lived at Alexandria, probably between 200 and 400 A. D. He is the author of the most ancient extant treatise on algebra, and is the reputed inventor of algebra, according to Lagrange and others. He wrote an important work called *Arithmetica*, in thirteen books, of which only six are extant.

Diop'sis [from Gr. δι-, two + ὄψις, view]: a genus of dipterous insects belonging to the family of flies (*Muscidæ*) remarkable for having the eyes and antennæ at the end of long, horny stalks growing from the sides of the head. In some instances the distance of the eyes from the head is almost as great as the length of the wings.

Dioptrics [from Gr. τὰ διοπτρικά, science of dioptrics; deriv. of διόπτρα or δίοπτρον, names of optical instruments; διά, through + root ὀπ-, see; cf. ὄψις, view]: that branch of geometrical optics which treats of the refraction of light, or of the changes which take place in the direction of rays transmitted from one medium to another (as from air to water, etc.), or through media of varying density. It is applied chiefly in the construction of telescopes, microscopes, and other instruments requiring the use of refracting lenses. See Optics and Lens; also Littrow, *Dioptrik* (1830); Prechtl, *Practische Dioptrik* (1828); Steinheil, *Angewandte Optik* (Leipzig, 1890); and Mascart, *Traité d'Optique*.

Dioptric System: an arrangement of lenses for condensing light in lighthouses; devised by Fresnel about 1819, and based on the discoveries of Buffon, Condorcet, Brewster, and others. See Lighthouse Illumination.

Diora'ma [from Gr. διά, through + ὅρᾱμα, vision, spectacle; deriv. of ὁρᾶν, see]: a mode of scenic display invented by Daguerre and Bouton, and first exhibited in Paris in 1822. The painting is viewed through a large aperture or proscenium, beyond which it is placed at such a distance that the light is thrown upon it at a proper angle from the roof, which is glazed with ground glass, and can not be seen by the spectator, who is in comparative darkness, receiving no other light than what is reflected from the painting itself. By means of shutters or curtains the light may be diminished or increased at pleasure; and some parts of the picture being transparent, light may be admitted through it—an artifice which secures the advantages of painting in transparency without its defects.

Di'orite: a name given near the beginning of the nineteenth century by the French mineralogist Haüy to a rock belonging to an important group of granular and massive greenstones, which in appearance and structure resemble granite, but which in composition differ materially from this rock type. Diorite is composed essentially of the two minerals hornblende and triclinic feldspar (oligoclase, andesine or labradorite). It is to the sharp contrast between these constituents that the rock owes its name (Gr. διορίζειν, to distinguish). Other minerals may, however, also be present in varying amounts, giving rise to varieties of the main type. Thus the most acid contain free quartz, and are known as *quartz-diorite*; the hornblende may be partially replaced by mica or augite, producing *mica-diorite*, *augite-diorite*, etc. The most frequent non-essential constituents are magnetite, apatite, and sphene. In general appearance and mode of occurrence diorite is so like granite that it is, as a rule, popularly known by this name. It is available for all the uses to which granite is applied.

In its origin diorite also resembles granite. It is usually an igneous rock, which owes its coarse and granular structure to the fact that it solidified slowly while deeply buried in the earth's crust. In chemical composition diorite is about equivalent to the volcanic or surface igneous rocks called Andesite (*q. v.*), and it occupies an intermediate position between granite and gabbro, just as andesite does between rhyolite and basalt. In many cases diorite has been shown to have originated from an augitic rock (gabbro) by the gradual alteration of its augite into hornblende. See Granite, Gabbro, and Rocks. George H. Williams.

Dioscor'ides Peda'nius (in Gr. Διοσκουρίδης Πεδάνιος): Greek botanist; b. at Anazarba in Cilicia; lived between 50 and 200 A. D. He traveled in Asia Minor, Greece, and Italy to procure information about plants, and wrote in Greek a celebrated work on materia medica, in which he describes or names more than 500 plants. This work was regarded as the highest authority for fifteen centuries or more, and was universally used by medical and botanical students. Best edition by Sprengel (2 vols., Leipzig, 1829–30).

Dioscu'ri (in Gr. Διόσκουροι) (i. e. sons of Zeus): a name given to Castor and Pollux (*q. v.*).

Dios'ma [from Gr. δίοσμος, transmitting odor, full of odor; διά, through + ὀσμή odor]: a genus of plants of the family *Rutaceæ*. The buchu leaves are obtained from the *Diosma crenata* and other species.

Diospolis: See Egypt, Ancient; also Thebes.

Dios'pyros [Gr. Διόσπυρος, name of a plant, liter., the wheat of Zeus; Διός, genit. of Ζεύς, Zeus + πυρός, wheat]: a large genus of trees of the ebony family, comprising about 100 species, mostly natives of the tropical parts of the Old World. They generally have hard wood, and many of them yield edible fruits. The persimmon tree of the Atlantic U. S. and Mississippi valley (*Diospyros virginiana*) is well known for its fruit, which becomes edible late in autumn, and for its wood, which is used by makers of lasts for shoes. It is represented in Texas and Northern Mexico by the *Diospyros texana* (persimmon, ebony, or japote). The pishamin or date-plum (*Diospyros lotus*) grows in Europe as far N. as London, and its fruit is made into preserves or eaten

without cooking. Other species are prized in China, Africa, and Japan for their fruit. The CALAMANDER-WOOD (*q. v.*) and several other diospyri of Asia are greatly valued for their timber. Among these is the true ebony (*Diospyros ebenum*), which grows principally in Ceylon. (See EBONY.) Remains of many fossil species are found in the Eocene of the U. S.

Dip: in geology, the angle of inclination of a stratum to the horizon. Where the country is level an inclined stratum cuts the surface in a line, and the direction of this line is called the *strike* of the stratum. The direction of the dip is at right angles to the strike. The belt through which a stratum is exposed at the surface is called its *outcrop*. In a level country the outcrop has the same direction as the strike; in a hilly or mountainous country it may have a very different direction. When strata are moderately regular, the line of strike is a very useful fact to determine, as it enables the geologist to follow the same bed, and when concealed suggests the place where he should seek for it. Beds dipping at a high angle are soon lost sight of, being covered up with other deposits of newer date. In the direction opposite to that of the dip beds of older date come up from below, or "crop out." Revised by G. K. G.

Diph'ilus of Sinope: a master of the new Attic comedy and contemporary of Menander; flourished in the second half of the third century B. C. He was especially famous for the comic effectiveness of his plots. The *Casina*, *Rudens*, and *Vidularie* of Plautus were modeled on plays of Diphilus, and Terence has borrowed from him in the *Adelphi*. In some of his pieces he wrote subjects that belonged rather to the middle comedy, such as Sappho. Fragments in the collections of Meineke, vol. iv., p. 375, foll., and Kock, vol. ii., p. 541, foll. B. L. GILDERSLEEVE.

Diphtheria [from Gr. διφθέρα, a skin, piece of leather, in allusion to the false membrane described below]: an acute infectious disease (also called *malignant sore throat*, *membranous angina*, etc.) characterized by inflammation of the mucous membrane of the pharynx, attended by an exudation of lymph, generally assuming the character of a false membrane, which may extend into the larynx and air-passages, into the œsophagus, and into the mouth, occasionally also appearing upon raw or mucous surfaces of other parts of the body; it is also attended by prostration and albuminuria, which may or may not be persistent. The infectious nature of this disease was long suspected, but finally and definitely proved by the discovery of the specific cause, a form of bacillus, generally known by the names of the discoverers—Klebs-Löffler. Its duration and symptoms are variable, and the distinctive exudation is by no means of uniform appearance. In general, the mucous membrane is congested, and the exudation growing from one or more centers, if torn away, leaves a bleeding and sensitive surface. The symptoms of the disease are those of a profound general depression, with fever and nervous disturbances, caused by the absorption of poisonous substances produced at the point of local infection by the action of the bacillus. Besides these symptoms there are those called forth by the local disease, such as intense sore throat with involvement of neighboring lymphatic glands, difficulty in breathing when the larynx is occluded by membrane, and the like. Laryngeal diphtheria is practically synonymous with croup, though there are cases of membranous croup which can not yet be called diphtheria with entire propriety. (See CROUP.) The prognosis is always grave, no case being free from danger. The mildest attack may be followed by paralysis or by fatal prostration. No routine treatment can be laid down for this disease. In mild cases it is permissible to use detergent washes for the mouth, and the general treatment may be mainly expectant, provided the pulse is firm. The medicinal preparations of mercury seem to have a decided influence in this disease, and are borne in very unusual doses, a proof that they supply some need of the system. Sulphate of quinia has the happiest effects upon many cases. The inhalation of vaporized water is an excellent measure. The treatment of the various sequelæ of diphtheria requires the careful use of tonics, such as strychnia and iron, with the best hygienic conditions. See ANTI-TOXINE. W. P.

Diphthong [from Gr. δίφθογγος; δι-, two + φθόγγος, sound, connected with φθέγγεσθαι, emit sound]: the union of two vowels pronounced together in one syllable, i. e. with one push or impulse of voice; thus *ou* in *loud*, *oi* in *soil*. An improper diphthong is one which is such only in orthography, as *ea* in *beat*. A genuine diphthong may, on the other hand, be represented by a single vowel sign, as *i* in *five* (pron. *faiv*). B. I. W.

Diph'yodont: See TEETH.

Diplograptus [from Gr. διπλόος, double + γραπτός, marked, engraved; γράφειν, write]: a genus of fossil Cœlenterates of the extinct sub-order *Graptolithidæ*; occurring in abundance in some of the black shales of the Silurian, distinguished from the monograptus by the occurrence of the cells in a double row along the slender stem or axis. H. S. W.

Diploma [Gr. δίπλωμα, a folded letter; letter of introduction, deriv. of διπλόος, double]: formerly any royal charter or letter-patent; so called because under the Roman emperors charters were inscribed on two tablets of copper, joined together so as to fold in the form of a book. The charter by which a physician or surgeon is declared qualified to practice his profession is called a diploma. The term is also applied to the certificate of graduation given to every one who has taken a degree in a college or university.

Diplomacy [deriv. of DIPLOMA (*q. v.*)]: the art of conducting the official intercourse between foreign states; it is generally managed by ambassadors instructed in the policy to be pursued, or by the ministers of foreign affairs. The negotiation of treaties forms an important part of the duties of these envoys, but frequently they exercise a delicate and yet profound influence over the nation with which they are sent to deal. In receiving his instructions, much must sometimes be left to the discretion of the diplomatist. Very early in history heralds and ambassadors are found bearing messages from one power to another. Generally these messages were special. It is only in modern times that diplomatists are established permanently in foreign courts to watch the interests of their own governments. From the very necessities of the case ambassadors have been held personally sacred, since, were it not so, it would be impossible for them to venture into unfriendly states. Even among barbarians their privileges were respected. When resident ambassadors first came to be employed they were looked on as spies, but as the usage became general its advantages were made manifest. It tends to bring nations nearer together, and to make them respect one another; when there are representatives of foreign states in each country, the community of nations is more vividly felt. Ambassadors become acquainted with the laws, institutions, and history of the land where they reside; they protect their countrymen who are there as travelers or residents; they foresee difficulties and are able to prevent them; they put their countries on their guard against the preparations for war of other states; and when they withdraw on account of war their absence causes the separation of the two countries to make more impression. Even the exchange of compliments, the opportunity of representing their country in expressions of friendship at public and festive gatherings, as well as by condolence and forms of sympathy—these minor uses of resident ministers will not be despised by those who rightly estimate the effect of such things on national feeling.
Revised by T. S. WOOLSEY.

Diplomatic Agents: ambassadors, ministers, and other representatives accredited by a sovereign or government to other sovereigns or governments. Every party to international law is a treaty-making power, and every such power must act by some representative. No inferior community, no body of lower grade than a state, no organization trying to become a state but not yet recognized as such, is entitled to send representatives abroad who have international rights. Bulgaria and Egypt, for instance, do not enjoy the right of embassy, being under the suzerainty of the Porte. How far the members of a confederation possess this right will depend upon the terms of their union. Thus in the Germanic confederation the right remained to the individual states composing it, while in the U. S. and in Switzerland it reposes in the general government only. In a personal union, like that binding Norway to Sweden, one set of diplomatic agents represents the two countries and their one sovereign. A province, or colony, or city may have agents in foreign lands, but such persons have none of the rights of *ambassadors*. This term, *ambassador*, may be used generically to include various grades or kinds of diplomatic ministers, and it is often used also to denote *one*, and generally the *highest*, class of such ministers. Other words are *legates* and *nuncios*, usually denoting representatives of the pope; *chargés d'affaires*, a term for a lower grade of ambassadors; *envoys*

and *plenipotentiaries*, which latter term generally means less than its derivation implies. There are again ambassadors sent for a particular object, and others whose functions relate to all the political transactions of one nation with another; there are temporary and resident ambassadors; there are also persons who discharge the office without taking the name. Thus kings or commanders of armies sometimes negotiate treaties. All ambassadors, of whatever rank they may be, have the privileges which belong to this class of persons by the law of nations.

As for the relative rank of diplomatic agents, the rules laid down by the plenipotentiaries of the eight leading powers concerned in the Congress at Vienna are generally followed, together with the supplementary rule adopted at Aix-la-Chapelle in 1818. The ranks are—(1) ambassadors, legates, or nuncios; (2) envoys, ministers, or others accredited to sovereigns; (3) resident ministers; (4) *chargés d'affaires* accredited to ministers of foreign affairs or secretaries of state.

The distinctions between these classes are not very clear. Ambassadors represent the person of their sovereign, and are received with almost equal dignity. Agents of the second class represent their sovereign in his affairs rather than in his person. Resident ministers deal usually with the state department, though representing in some degree the person and dignity of their sovereign. They are treated with less ceremony than ambassadors or envoys. *Chargés d'affaires* represent their foreign ministers only. In the diplomatic service of the U. S. ambassadors are now employed in some cases, but minister resident is the rank customary, and previous to 1893 no diplomatic agent of higher rank than that of envoy extraordinary and minister plenipotentiary ever represented the U. S. in foreign countries.

In each class or rank the diplomatic employees take precedence among themselves according to the date of the official notification of their arrival. When the ministers of several powers sign acts or treaties in common the order of signature is determined by lot. These rules cut off some of the quarrels between ambassadors of different nations in regard to rank and national honor, which were not infrequent in earlier times. It may be noticed here that one minister may be accredited to two different powers; on the other hand, two of the smaller states may be represented by a single agent at one court.

Ambassadors have had from very early times a sacred character, which has been sometimes accounted for by their being originally persons of a religious order; but it is better to say that the office was protected by religious sanctions on account of its great importance and because without personal inviolability it could not be usefully administered. The ancient herald became a sacred person because he could not otherwise safely mediate between armed men. The ambassador needs for his protection the same sanctions, and, as he represents the highest interests of a state, it is a great crime to treat him with indignity or injury. There is a difference between the ambassadors of ancient and those of modern times, consisting especially in *this*—that the former were sent for a temporary purpose, and returned after completing their work; but the latter, since the time of Louis XI. of France and Ferdinand the Catholic of Spain, have generally resided in the foreign country for a considerable time. The resident minister is now expected to make himself acquainted with the politics of the country where he lives, to calculate the chances of war and peace, to use a constant influence in behalf of his own country; and thus, since this custom began, nations have felt themselves more secure than before. As intercourse is suspended by war, ambassadors, on the outbreak of a war or in expectation of it, are either dismissed or summoned home. When peace returns, the renewal of intercourse is marked by the parties receiving each other's diplomatic representatives.

An ambassador represents the sovereign or the sovereignty of his country. In a republic the power of appointing such officers is determined by the constitution or the laws, but instructions are given by the executive authority. In the U. S. diplomatic agents are appointed by the President with the confirmation of the Senate. In most monarchies the king or emperor appoints those who represent him in foreign courts, but this he does as the head of the government. Hence, when a sovereign is deposed and is no longer the actual head of the administration, other countries are not bound to recognize his ambassadors, nor, on the other hand, are they bound to receive those of a new sovereign *de facto*. The rule here, apart from dynastic and political preferences, is the same which holds good when new states are recognized. When the *de facto* government is acquiesced in by a country, and is in orderly operation, other countries will enter into new diplomatic relations with it. If agents of the old and displaced authority are received also, they will have no rank, and to do this at all after an established state of things exists in the revolutionized country is an unfriendly proceeding, implying a hope that there may be a counter-revolution.

There is no positive obligation on the part of one state to enter into diplomatic relations with another. But if such relations have been customary, to break them off is proof of an unfriendly disposition. As a rule, a government will accept the agent accredited to it without question. His social position, religion, profession, training, and fortune are matters which concern only his own state. But there are certain reasons which will warrant a country in declining to receive him. If he be a notoriously bad character, it will ill accord with the dignity of a state to do so. If he be a subject of the country to which he is sent, he may be objected to, since his diplomatic immunities will conflict with the rights which that country has over him. Mr. Burlingame, for instance, the negotiator of a number of treaties with foreign powers in behalf of China, was treated with in the U. S. as a special agent and not as an envoy, since he was still a U. S. citizen. If a proposed minister has expressed views hostile to the government to which he is accredited, or merely if he is personally disagreeable or unacceptable to it, a *persona non grata*, his coming may be declined, though not without explanation, for one of his chief duties is to foster friendly relations between the two countries, and if his character, sentiments, or antecedents render this work clearly impossible, he may be fairly objected to. Thus, in 1892, China declined to receive Senator Henry W. Blair, because he had spoken in Congress in favor of the exclusion of Chinese from the U. S. and had denounced the Mongolian race. But if an ambassador is received he is entitled to all the privileges of his office, whatever may have been his history, as when, in 1888, Mr. Carl Schurz was sent by the U. S. to Prussia and fulfilled his mission, though a political exile from that country.

The privileges of ambassadors may be comprised under the terms inviolability and exterritoriality. As the privileges themselves are, in great part at least, due to comity, and as the feelings of men will change from age to age with changes of civilization and greater closeness of intercourse, these terms, especially the second, may vary somewhat in their extent of meaning. It will not be safe to give to exterritoriality the broadest meaning it can bear, and then from that meaning deduce the privileges accorded. We must inquire what is the general understanding of the present age in regard to the position which an ambassador may take in a foreign land, and then perhaps it may happen that his own country will somewhat contract his latitude of privilege. The privileges in question are (*a*) inviolability of person; that is, exemption from all violence, whether proceeding from the public authority or from private persons. The exceptions to this rule are that the public authority, when he has committed a gross crime, may send him beyond the borders, using so much force as is necessary for this end; and that private persons do not lose their rights of self-defense if he is an aggressor. (*b*) He has various privileges, summed up in the word exterritoriality, which amount to exemption from the operation of foreign law. There is no departure from the theory of his office if when he returns home he is called to account for transactions pronounced to be illegal by his country's laws which take place while he resides abroad, and if he commits a crime such trial is a matter of course. His first privilege—which may be referred to his inviolable character, as well as to his exterritorial—is his *exemption from the criminal jurisdiction* of the country where he is resident. If there he commits crimes, acknowledged to be such by the moral sense of mankind, he can not be tried or punished, but can be required to leave the land, and only in an extreme case, if he refuses to do this, can force be applied. He can not be forced to testify in a criminal case where he has been witness to the act, though his government may instruct him to do so. He can not commit treason, but he can abet treason and be a party to revolutionary measures, yet his punishment must be left to his own sovereign and country. Some of the older British lawyers, as Sir Matthew Hale, thought that any capital offense except treason—as rape, murder, or theft—might subject an ambassador to indictment and trial

like other aliens; and still later it was held that for crimes committed by them against those moral laws which keep all societies together they might be brought to justice like other offenders. But this opinion would hardly find favor at present. Both the law and the feeling of England have increased in the respect they attach to these foreign representatives. The need of a rule is obvious, for if subject to arrest and trial an ambassador might not be able to discharge his functions. (*c*) The diplomatic agent is exempt from the *civil* jurisdiction of the land where he is resident. This exemption is conceded to him everywhere, although it is not strictly necessary for the discharge of his duties. If he contracts debts, the only remedy is by appeal to his sovereign or by suit in his country's courts after his return home. The laws of the U. S. include distress for rent among other legal remedies which are denied to the creditors of a foreign minister. Moreover, it is not enough that he be free from the consequences of conviction; no suit against him should be brought. In the case of M. Drouet, a Belgian secretary of legation in 1854, the British courts denied this, but if this principle held there would be no real immunity. (*d*) The hotel also and the goods of an ambassador have the same immunity from local jurisdiction. As far as he himself and his retinue are concerned, his house is a sanctuary, but the immunity will not allow him to defy the law of the land by sheltering transgressors. It is admitted, on all hands, at the present day that criminals belonging to the country of his residence, if not his servants at the time of the crime, may be searched for and seized in his hotel, and that all the force necessary for effecting an entrance for this purpose may be applied. (*e*) By national comity the personal effects of the foreign minister and the articles from abroad which he needs for himself and his family are exempt from duties. He is also free from the payment of local taxes, except upon real property not used by him for legation purposes. Even on the legation property, owned by himself or his government, taxes are levied in some states, and certainly all police, sewerage, street, or other local dues should be paid, though they are not collectible by process of law. In the U. S. the rule of reciprocity is observed, water, paving, and sewerage dues and taxes on legation property being collected if similar property owned by the U. S. in the country of the foreign minister in question be taxed. He is liable to the payment of tolls and postage, but can not be compelled to have troops quartered upon him. Formerly, ambassadors abused their privilege of having goods passed free of duty through the custom-house, and, as Bynkershoek, near the beginning of the eighteenth century, charges upon them, they imported merchandise which they afterward sold. The same abuse continued for some time afterward, and was, when discovered, complained of in more than one country. A minister of the U. S. in Spain has been charged with making importations for himself on account of certain merchants. It is plain that exemptions from duties were never intended to cover any articles besides those intended for the use of the embassy, and it would be no breach of comity to have even this privilege taken away. (*f*) Liberty of worship. This is allowed in all Christian lands, and even beyond their borders, to ambassadors, their families, and, by a stretch of comity, to other persons belonging to the same nation, but co-religionists with the ambassador, if subjects of the state in whose bounds he resides, are permitted only by sufferance to be present. This exemption, of course, has no significance where, as in the U. S., all religions are free; and it has, at least in one instance, been claimed that, where there was already a church of the religion which the foreign minister professes, the permission to set up another for himself might be denied him. The jealousies of Catholic and Protestant Christians in times past have led to the rule that the ambassador's worship must be *private*, and even *house*-worship, without bell, organ, or other sign making it known to the public, and that the chaplain must not appear in his canonicals. The reasons for this freedom of worship are obvious. No state could with any regard for its own dignity consent to send a minister to another court where he was forbidden to exercise his own or his country's religion, and no honest or honorable man would be willing to represent his government where such prohibition existed. (*g*) That the foreign minister may freely discharge his functions he must have some assurance of having his retinue at command. Accordingly, his family, the secretary of legation, and the other officials who compose his train have the same exemptions which are conceded to him. In this privilege his servants are usually included, as well as the bearers of his dispatches. The dispatches themselves, as well as the embassy records, are of course inviolable. But it should not be forgotten that these immunities are granted a foreign diplomatic agent solely in order to enable him to transact his business unfettered and smoothly, and they should be construed strictly and in accord with this principle. No minister wishes to make his residence a place of refuge for criminals. If such escape to him, they should be surrendered; even his own servants in most cases should be handed over to the local authorities for trial. (*h*) If the state itself has no direct control over an ambassador's suite, it is evident that he ought to have, but how much power he may use over them is a matter, in part, for his own country to decide. In former times the jurisdiction of foreign ministers was almost as great as that of consuls from Christian states in Mohammedan countries. When Sully, then Marquis of Rosny, represented the French court in England in 1603, one of his train having killed an Englishman in a quarrel, a jury of Frenchmen was called together, found the man guilty, and delivered him over to the English authorities for execution. It is evident that such exercise of high justice would not now be allowed in any Christian state, and no notice would be taken of such a procedure. The ambassador now will collect evidence in criminal cases and send a member of his suite home for trial, unless indeed he prefers, as already suggested, to turn him over to the local law. Nor has he properly any *civil* jurisdiction except that of a voluntary kind, such as receiving and legalizing testaments and affixing his seal. "The right of contentious jurisdiction is nowhere," according to Heffter (§ 216), "conceded to ambassadors in Christian countries, even over the people of his suite." In Oriental countries, however, a certain degree of jurisdiction, both civil and criminal, is often conferred upon resident ministers and consuls by treaty. See EXTERRITORIALITY and CONSULS. (*i*) Has the ambassador such a kind of inviolability that third parties—for instance, enemies of his country—are bound to respect his official immunities? The answer given by history is that one enemy has had no scruple at capturing negotiators of the other, and at treating them like every other foe in war. Further, although a friendly power would be regarded as committing a hostile act if it seized or imprisoned such a person, yet it might refuse him transit through its territory, and in the act of transit, if he were found passing into a hostile country, he might be prevented from pursuing his journey, for his diplomatic *rights* hold good only in the country to which he is sent. Cases have occurred also where foreign ministers were arrested in a third country on account of pecuniary obligations contracted there. But there is no right to seize even an enemy's ambassador on a neutral ship, much less on neutral soil. Where one country is invaded by another, neutral ambassadors there resident have the right of personal inviolability, and should be permitted free intercourse with their own government and with that to which they are accredited. Yet during the siege of Paris in 1871 the U. S. minister was allowed to send his dispatches through the German lines only unsealed, which was stretching belligerent rights unduly. (*j*) The ambassador's rights begin when he lands in the country to which he is sent, and continue until he leaves its soil; and this whether he is received or not, and whether or not peaceful relations continue between his country and that to which he is sent. On his arrival at the court to which he is commissioned he is expected to produce his letter of credence—which is sometimes accompanied by one of recommendation—and his *full power*, which indicates the subjects on which he is authorized to treat and the amount of power with which he is invested. According to their rank, some envoys are accredited directly to the sovereign of the country, and some to the minister or secretary for foreign affairs; in either case diplomatic business will usually be transacted with the latter. After an audience with the sovereign or chief executive, at which the original letter of credence is presented, the official character and capacity of the new diplomat are established. He will then pay visits of etiquette to the members of the diplomatic corps, and in other respects conform to the usages and ceremonial of his place of residence, remembering that his usefulness must largely depend upon his tact, breeding, temper, sense, and ability to transact business smoothly as well as skillfully. (*k*) The ceremonial of departure is as formal as that of reception. The mission of a diplomatic agent may end from several causes. He may have accomplished the purpose for which he was sent if this was a specific one.

He may be recalled for promotion elsewhere; because he is distrusted; to indicate relations which are inconsistent with friendly intercourse. Thus in 1891 the Italian agent, Baron de Fava, was withdrawn from Washington because of the lynching of Italian subjects at New Orleans, on Mar. 14 of that year. His recall may be requested by the state to which he is accredited on account of his intrigues or misconduct. The death of the sovereign sending or receiving him, or a change in the form of government in either state, will also terminate his mission, though it may be readily revived by fresh credentials from or to the new sovereign, or from the new government if it has secured recognition.

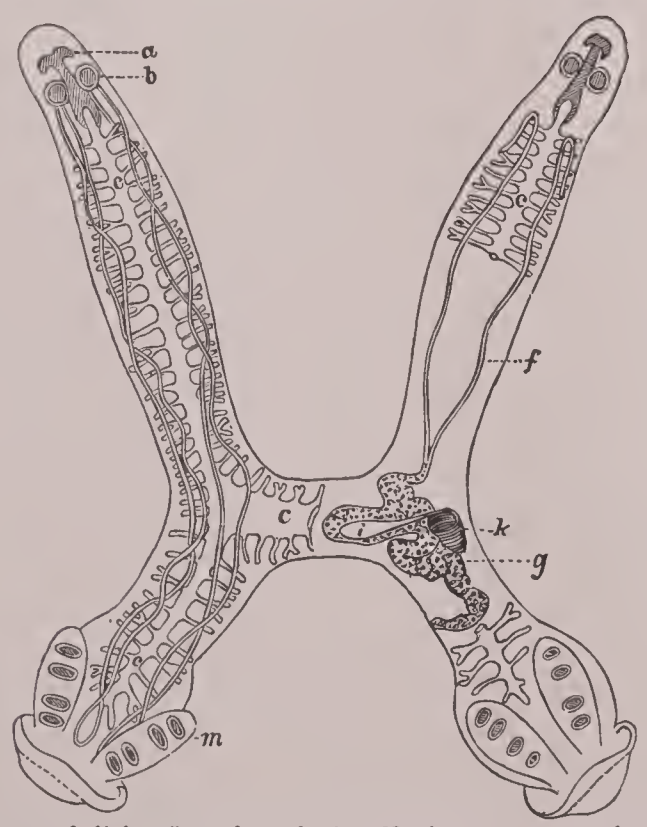
By Article III., §§ 1, 2, of the Constitution of the U. S. the Supreme Court was given original jurisdiction in all cases affecting diplomatic agents and consuls.

By the statute of Apr. 30, 1790, all writs or processes aimed at their persons or property and including their suites and households are declared null and void under penalty. Laws to enforce these diplomatic privileges have been widely enacted in other countries. T. S. Woolsey.

Diplomatics [deriv. of Diploma (*q. v.*)]: the science of diplomas, i. e. of ancient legal documents. It classifies their parts, tests their genuineness, studies the circumstances of their creation, and thus determines their worth as historical evidence. Their dates and seals draw into its province historical chronology and sigillography. Until the nineteenth century palæography, the art of deciphering ancient handwriting, was counted a part of diplomatics; but the two are now distinct sciences. Diplomatics was, in 1681, brought into existence as a science, and given a name, by the *De Re Diplomatica* of the Benedictine Mabillon. Its principles were more fully developed in the *Nouveau Traité de Diplomatique* (1750–65) of Toustain and Tassin. The most elaborate modern treatise is Bresslau's *Urkundenlehre für Deutschland und Italien*; but the one comprehensive handbook is Giry's admirable *Manuel de Diplomatique* (Paris, 1894). Leist's *Katechismus der Urkundenlehre* is a convenient primer. See Palæography. George L. Burr.

Diplopoda: See Myriapoda.

Diplozo'ön [from Gr. διπλόος, double + ζῷον, animal]: a parasitic trematode worm which, in the adult condition, is a veritable double animal. The young animals, formerly known as diporpa, have each a dorsal and a ventral sucking



Anatomy of diplozoön, enlarged after Nordmann: *a*, mouth; *b m*, suckers; *c*, digestion tract; *f*, excretory tubes; *g k*, reproductive organs.

disk. Two of these come together, adhere to each other, and finally grow into one—the Diplozoön—shaped like the letter X. The genus has not been found in America, but is not uncommon in Europe upon the gills of the breams.

J. S. K.

Dipnoi, dip'nō-ī [from Gr. δι-, double + πνεῖν, to breathe]: an almost extinct group of fish-like forms which show affinities toward the Ganoids and the Batrachia. The skeleton is partly cartilaginous, partly converted into bone. The skull consists of but few bones, while the strong jaws have but few very large teeth. On either side of the throat are four, or fewer, gill-slits, while respiration is mostly accomplished by means of one or two lung-like organs homologous with the swim-bladder of the true fishes. The heart has a muscular conus arteriosus with internal valves, and there is a spiral valve in the intestine as in the Ganoids. The body is covered with scales (large in the Australian, small in the other forms), and the two pairs of fins are weak, in the Protopterus having an axial skeleton with rays on one side, in Ceratodus with rays on both sides. The species popularly known as lungfishes are divided into two groups—(1) *Monopneumonia*, with large scales, four large teeth in the upper and two in the lower jaw; a single symmetrical lung; (2) *Dipneumonia*, with small scales, small teeth, and two lungs. To the first belongs the genus *Ceratodus*, with two species from Australia; to the second the genera *Protopterus*, with one African species, and *Lepidosiren*, with a single species from Brazil. This distribution indicates great antiquity, a view which receives support in the fact that *Ceratodus* occurs in rocks of Permian age. The African lungfish lives in the streams of equatorial Africa, and at the dry season it burrows into the mud, where it forms "cocoons," which have an opening for breathing and which are frequently shipped as curiosities to Europe. Specimens of all four species are comparatively rare in collections, only two individuals of the South American species being known. J. S. Kingsley.

Dip of the Horizon: in navigation, the apparent depression of the sea horizon, or line between ocean and sky, below a horizontal line going out from the eye of the observer. It arises from the rotundity of the earth. It varies with the state of the air, but its amount, in minutes of arc, is nearly equal to the square root of the number of feet the eye of the observer is above the ocean. The following table shows the dip at different heights in feet:

Height.	Dip.	Height.	Dip.	Height.	Dip.	Height.	Dip.	Height.	Dip.
1	0′ 59″	10	3′ 3″	19	4′ 13″	28	5′ 2″	65	7′ 48″
2	1 22	11	3 12	20	4 20	29	5 13	70	8 06
3	1 40	12	3 21	21	4 26	30	5 18	75	8 23
4	1 56	13	3 29	22	4 32	35	5 43	80	8 39
5	2 10	14	3 37	23	4 39	40	6 07	85	8 55
6	2 21	15	3 45	24	4 45	45	6 29	90	9 11
7	2 33	16	3 52	25	4 51	50	6 51	95	9 26
8	2 43	17	3 59	26	4 56	55	7 11	100	9 41
9	2 54	18	4 06	27	5 02	60	7 30	110	10 09

Dippers: popular name of birds of the genus *Cinclus* and family *Cinclidæ* which contains the ouzels, found in Europe, Asia, and America. They feed chiefly on mollusks and on aquatic insects and their larvæ, which they seek in clear lakes and streams, frequently diving with great facility, and moving about under water by means of their wings. They resemble the wren in their manner of dipping the head, accompanied with an upward jerking of the tail. The dippers build very curious nests of interwoven moss, having the entrance in one side.

The term is frequently applied on the New England coast to small ducks and diving fowl, especially to the bufflehead (*Charitonetta albeola*) and the ruddy duck (*Erismatura rubida*). Revised by F. A. Lucas.

Dipping Needle: an instrument showing the magnetic dip. When a magnetic needle is hung within a stirrup so as to move freely in a vertical direction, and the whole system is suspended by a thread, it will adjust itself in the magnetic meridian, and its pole will dip toward the north pole of the earth. Such a needle is called a *dipping needle*, and its deviation from the horizontal line is its *inclination*. When the needle is carried nearer the magnetic pole the inclination increases. Sir James Ross in 1832 saw the dipping needle stand within one minute of a degree of the vertical position near Baffin's Bay. Approaching the equator, it becomes less and less inclined, until a point is reached at which it is horizontal. This point will be in the *magnetic equator*, or line of no dip, which is near, but not coincident with, the equator of the earth. When tracing the lines of equal dip on a Mercator's map, we find that they coincide in a remarkable manner with the isothermals or lines of equal mean temperature, indicating a close connection of the distribution of heat with that of magnetism, and seemingly a common cause for both.

The inclination, like the declination, is subject to periodic and secular variations. Since 1671 it has steadily diminished at the rate of three to five minutes a year.

Dipsaceæ: See TEASEL FAMILY.

Dip'sas [Gr. διψάς, -άδος, name of a venomous serpent, whose bite caused intense thirst, deriv. of σίψα, thirst]: a genus of non-venomous serpents belonging to the *Colubridæ*; natives of the warmer parts of America and Asia. They are tree-snakes, greatly elongated in form, and having a broad, thick head; some are of large size. Etymologically the name is inappropriate.

Dip-sector: an instrument constructed on the principle of the SEXTANT (*q. v.*) for ascertaining the dip of the horizon.

Dipsomania [from Gr. δίψα, thirst + μανία, madness]: in pathology, a morbid craving for alcoholic drinks, sometimes called methomania. The disease has been successfully treated in "inebriate asylums" in various countries. The term is also sometimes applied to DELIRIUM TREMENS (*q. v.*).

Dip'tera [from Gr. δίπτερος, having two wings; δι-, two + πτερόν, wing]: the order of true insects which includes the flies. They are the most differentiated (highest) of all insects, and are characterized by having the various mouth parts so modified into a piercing and sucking organ that the different elements can only with difficulty be traced. The eyes are very large; the anterior wings alone are of use in flight, the second pair are reduced to short clubbed "halteres" or "balancers," the latter name given in allusion to the fact that without them the fly can no longer direct its flight. In their development the flies undergo what is known as a "complete metamorphosis." The larvæ, commonly known as maggots, are usually footless, and some have lost the sense organs and biting mouth parts. In some (Coarctata) the pupa is inclosed in a hardened pupa case; in others (Obtecta, e. g. the mosquito) the pupa is free and capable of motion. The Diptera are divided into two sub-orders: (1) *Brachycera* (Gr. βραχύς, short + κέρας, horn) with short antennæ. Here belong the common house-flies, blow flies, bat flies, and the like, as well as certain forms which, like the sheep louse, have so degenerated by parasitism that they have lost the wings. (2) *Nemacera* (Gr. νῆμα, thread + κέρας, horn) with long, often feathered, antennæ, containing the midges, the mosquitoes, gall flies, Hessian flies, and the like. The fleas (APHANIPTERA, *q. v.*) are sometimes placed here. See ENTOMOLOGY.

J. S. KINGSLEY.

Dipterocar'pus [from Gr. δίπτερος, two-winged + καρπός, fruit]: a genus of resinous trees of the family *Dipterocarpeæ*, including about fifty species, all natives of tropical Asia. They are large trees with opposite simple, entire or dentate leaves, clusters of large white flowers, each with a tubular, five-cleft calyx, which in fruit has two greatly enlarged lobes, petals five, stamens many, ovary superior, three-celled, each cell with two ovules. *D. turbinatus* of India attains the height of 200 feet, and is valuable not only for its durable timber, but also for an oil which is used in medicine and the arts. Other species yield resins. C. E. B.

Dip'terus [from Gr. δίπτερος, two-winged; δι-, two + πτερόν, wing]: a genus of ganoid fishes whose fossil remains comprising two species are found in the Old Red sandstone. They have a large and flattened head, and double anal and dorsal fins, opposite to each other.

Diptych, dip'tik [from Gr. δίπτυχος, of double fold; δι-, two + πτυχή, πτύξ, fold, connected with πτύσσειν, to fold]: in the later times of the Roman empire, a pair of tablets of ivory or wood, covered on one side with wax. This form had been in use from early times, but the name is generally given to the presentation tablets given as presents by consuls and questors, under the empire. A number of these of the fifth and sixth centuries remain; they are elaborately carved, contain the name and titles of the consul, and were distributed by him among his friends on entering his office. On one side of the sacred diptych were inscribed the names of living, and on the other those of deceased, ecclesiastics and benefactors of the clergy, which were read during service by the deacon. They were often decorated with scenes from biblical history. Diptychs are still used in the Eastern churches. See TRIPTYCH.

Diræ: See EUMENIDES.

Direct Inheritance Tax: See INHERITANCE TAX in the Appendix.

Director [Lat. deriv. of *diri'gere*, *direc'tus*, direct, control; *dī* (*dis-*), apart + *re'gere*, direct]: one who directs or manages; usually one of a number of individuals whose duty it is to conduct the affairs of certain enterprises, such as banks, railways, insurance companies, etc. Directors are usually elected by the stockholders from their own number; they have the right of supplying casual vacancies, and may delegate their powers to committees of such number as they may judge expedient. The title is also usually given to the chief officer or superintendent of an astronomical or physical observatory.

Directory (in Fr. *directoire*): in French history, the executive body of the French republic established by the constitution of 1795 which represented moderate republicanism and marked the downfall of the Jacobins. This constitution vested the legislative authority in the Council of Five Hundred with the exclusive right of initiating the laws and in the council of the ancients consisting of 250 members who considered the laws proposed by the former body. The Directory consisted of five persons called directors (*directeurs*), who were selected by the Council of Elders from a list of candidates presented by the Council of Five Hundred. Their names were Barras, Carnot, Larevellière de Lépeaux, Letourneur, and Rewbell. One of them retired every year, and was succeeded by another chosen in the same way. Each director presided for three months in turn. They came into power at a time when France was involved in war with nearly all Europe, and was distracted by domestic factions. The French armies gained many victories under this *régime*, but the home policy of the Directory was unpopular. The Directory was divided into two parties, and the majority, consisting of Barras, Larevellière de Lépeaux, and Rewbell, removed their adversaries by the *coup d'état* of the 18th Fructidor (Sept. 4, 1797). In 1797 the directors were Barras, Ducos, Gohier, Moulins, and Sieyès. The growing popularity of Napoleon, the dissension in the government, and above all the disastrous results of its military policy in 1799, prepared the way for its overthrow by the *coup d'état* of the 18th Brumaire (Nov. 9, 1799), in which Napoleon, his brother Lucien, and Sieyès were the chief actors. See Barante, *Histoire du Directoire* (1855). See FRANCE.

Directory: a book containing the names of the inhabitants of a city arranged in alphabetical order, together with the place of business or residence or both. The first London directory, *A Collection of the Names of Merchants, etc.*, was published in 1677. In the U. S., as in Great Britain, every town of importance has its own directory. In several States there are also published *State directories*. In New York city the earliest published was in 1786—a small volume of eighty-two pages with about 900 names.

Directrix, plu. **Directrices** [femin. of *director*, formed on analogy of Lat. *ja'nitrix*: *ja'nitor*, *ge'netrix*: *ge'nitor*]: in geometry, a line which serves for the description of a curve or surface. The directrix of a conic is a right line perpendicular to the axis, whose distance from any point on the curve bears a constant ratio to the distance of the same point from the focus. Quadric surfaces have also directrices possessing analogous properties. When a surface is conceived to be generated by the motion of a line, right or curved, which always rests on other fixed lines, the latter are sometimes called directrices, but more frequently directing lines or directors, the former being distinguished as the generator.

Dirge [M. Eng. *dirige* = Lat. *dirige*, direct, 2d sing. impv. of *diri'gere*; the initial word of the funeral hymn beginning: "Dirige Domine, Deus meus, in conspectu tuo viam meam" (Direct, O Lord, my God, my way in thy sight), Ps. v. 8.]: a hymn of a mournful character sung at funerals, much used in the services of the Roman Catholic Church.

Dirk: See DAGGER.

Dirschau, deer'show: a town of Prussia, province of West Prussia, on the river Vistula, and on the railway from Berlin to Dantzic, 20 miles S. S. E. of Dantzic (see map of German Empire, ref. 2–J). It has a railway bridge 2,843 feet in length, machine-works, tanneries, sugar-refineries, etc., and a transit trade by the river. Pop. (1890) 11,897.

Dis [Lat. from weak form (*div.*-) of same stem as in *Jupiter* (*dieu*-), or, as some hold, a contraction of *divcs*, rich, cf. πλούτων]: a name of Pluto, sometimes applied to the infernal regions. See PLUTO.

Disability: in law, the quality or state of being incapable of enjoying certain legal benefits or of doing a legal

act; also, the fact or circumstance which makes a person so incapable. The disability is either absolute, as in the case of outlawry or attainder, or it is partial, as in the case of infancy and coverture. It may arise from the act of God, of the law, of the person himself, or of his ancestor. See CAPACITY. Revised by F. STURGES ALLEN.

Disappointment, Cape: See CAPE DISAPPOINTMENT.

Disciples of Christ: a religious body often, in the Southern and Western U. S., called the "Christian Church," or "Church of Christ"; sometimes "Campbellites," a name which is repudiated, however, as they are opposed to all party or sectarian names.

Origin.—In Sept., 1809, Thomas Campbell, a minister in the Seceders' branch of the Presbyterian Church, who had migrated from North Ireland in 1807 to Western Pennsylvania, being grieved by the bitterness of party spirit among Christians of different denominations, issued a "declaration and address" deploring the divided state of the Church and the evils resulting therefrom, and urging, as the only remedy for this state of things, a complete restoration of primitive apostolic Christianity—its faith, its doctrine, its ordinances, and its life, and the consequent rejection of all creeds or confessions of faith which stood in the way of such return to the ancient order of things. An association was formed, called the Christian Association of Washington, Pa., for the purpose of promoting the principles set forth in this new declaration of independence. About this time Alexander Campbell, son of Thomas Campbell, arrived on the scene, fresh from his studies at Glasgow University, Scotland, being then in his twenty-first year, and having but recently dedicated his life to the ministry. He threw himself heartily into the new movement, and by his ability, learning, and force of character soon became its recognized leader. It was not the intention of the Campbells at first to form a distinct religious body, but so to leaven the churches with the principles they advocated as gradually to effect the needed reforms. Failing, however, to find hospitality or even tolerance for their plea within the fellowship of any of the denominations, they found themselves compelled, by the necessities of the case, to assume an independent position. Accordingly, the Brush Run church was organized on May 4, 1811, being the first congregation formed by the new movement.

Basis of Union.—In assuming an independent position, the reformers, as they were then called, did not cease their plea for Christian union, which they believed it their special mission to promote. Hence in forming the first church they were careful not to include anything in the terms of fellowship which the Scriptures did not expressly warrant. A favorite motto at this time was, "Where the Scriptures speak, we speak; where the Scriptures are silent, we are silent." Under this rule, first enunciated in the "declaration and address" of Thomas Campbell, they felt compelled to surrender some tenets and practices which they had hitherto held as binding, and to adopt others which they had heretofore disregarded. Having, however, repudiated the authority of human creeds, they felt free to make such changes as would bring them into strictest harmony with the Word of God, and enable them the more effectively to plead for union on a divine basis. In yielding the practice of infant baptism because they could find no scriptural authority for it, and in adopting immersion as the proper form of baptism because the New Testament seemed to teach clearly that such was the original practice, they found themselves so nearly in accord with the Baptists as to be received into one of their associations, and for a time cooperated with them. But it soon developed that the principles of restoration held by the Campbells and their coadjutors were too sweeping for a majority of the Baptists, and the relation was discontinued, though many Baptists embraced the principles of the Disciples, and went with them. Henceforth new congregations were formed on the simple New Testament basis. All who gave credible evidence of faith in Jesus Christ were, upon confessing him, baptized and received into the fellowship of the Church, being asked only to take Christ as their leader and the New Testament as their guide.

Cardinal Principles.—Aside from the great fundamental truths which the Disciples of Christ hold in common with all evangelical Christians, the following are some of their characteristic principles: 1. The Church of Christ is intentionally and constitutionally one; and all divisions which mar this unity are contrary to the will of God, and should be terminated. 2. As these divisions resulted from a *departure* from New Testament Christianity, the remedy for them is the *restoration* of the Gospel in its purity. 3. This restoration involves the surrender of all human formulations of doctrine as authoritative bases of Church fellowship, and the acceptance of the Bible alone as the rule of faith and practice; and the confession of Jesus as the Christ, the son of the living God, by Simon Peter (Matt. xvi. 16) as the creed of the Church; the exchange of all party names for scriptural names, and the restoration of the ordinances to their original meaning and place, baptism being the burial in water of a penitent believer who has died to sin, and the Lord's Supper being a memorial feast to be observed each first day of the week as the central act of worship. 4. The faith which justifies and saves has Christ, not dogma, for its object, and is a vitalizing force which issues in practical righteousness, and leads to a life of obedience, and not an orthodox set of notions about God. The polity of the Disciples is congregational, the local officers consisting of elders and deacons, besides a minister or pastor, who may be one of the elders. They combine in district, State, and national organizations for missionary work, but have no general ecclesiastical body for legislative purposes.

Numerical Strength.—The growth of the Disciples has been remarkable. Beginning in 1811 with a single congregation of about thirty members, they numbered at the death of Mr. Campbell, in 1866, over 300,000. Statistics for the U. S. taken in 1899–1900 show 10,528 churches, 6,339 ministers, 1,149,982 members, and 732,642 Sunday-school scholars and teachers. They have also a few churches in Great Britain and on the Continent. The General Christian Missionary Society (home), organized in 1849, raised and expended during 1899 $100,550. The Foreign Christian Missionary Society, organized in 1875, has missions in India, China, Japan, Turkey, England, and Scandinavia. Its principal stations are 24; out-stations, 35; missionaries, 64; native helpers, 46; in all, 110. In 1899 it raised and expended $180,016. The Christian Woman's Board of Missions (home and foreign), organized in 1874, raised and expended $106,723 in 1899.

Institutions of Learning.—Among their principal schools are Bethany College, Bethany, West Va.; Kentucky University, Lexington, Ky.; Butler University, Irvington, Ind.; Drake University, Des Moines, Ia.; Hiram College, Hiram, O.; Eureka College, Eureka, Ill.; Christian University, Canton, Mo. There are, besides these, many small colleges. All these make the Bible a text-book. Their principal publishing-houses are the Christian Publishing Company, St. Louis, Mo., and the Standard Publishing Company, Cincinnati, O. The Disciples publish twelve religious weeklies and one quarterly magazine. See CHRISTIANS and CHRISTIAN CONNECTION. J. H. GARRISON.

Discipline, Ecclesiastical: the means employed by churches to maintain correctness of life among their members, orderly government in church affairs, and to prevent the spread of heresy in their ranks. In the Middle Ages discipline was either penitential (that is, inflicted on those who confessed their sin; see PENANCE) or punitive, which was, in theory at least, frequently administered by the civil power.

Discipline, First and Second Books of: important documents in the ecclesiastical history of Scotland.

The *First Book* was drawn up in 1560 by John Knox and four others. It lays down rules for the election and support of ministers and other officers; for the conduct of public worship and the administration of the sacraments; for the maintenance of schools and colleges; and for ecclesiastical discipline. Though subscribed to by many of the nobles, it was never acknowledged by an act of Parliament.

The *Second Book of Discipline* was drawn up by a committee, and submitted to the General Assembly in 1578. Andrew Melville took a leading part in preparing it. It was adopted, but Parliament would not ratify it. It was designed to correct and augment the *First Book*, which was a hasty performance, and on the basis of it the present constitution of the Church of Scotland rests. Both books are standards in that church.

The *Discipline* of the Methodist Episcopal Church is a volume containing all the doctrines, administrations, and ritual forms of that denomination, and is revised every four years, so as to include the changes made by the quadrennial or general conference.

Discipline, Military: the training and educating the soldier or sailor in all the duties of his profession, and the implanting of that respect for authority which causes him to obey without question the legal orders of his superiors under all circumstances, even to the unhesitating sacrifice of his life. It can not be obtained without good organization and thorough and continued instruction. It is the essential factor in preserving the zeal, spirit, and confidence of troops under the depressing influence of defeat, as well as in restraining the excesses and preventing the demoralization which result from victory. The term is frequently, but improperly, so restricted in its meaning as to include only instruction in drill, and the punitive or "disciplinary measures" used in armies and navies. JAMES MERCUR.

Disclaimer: in law, (*a*) in equity pleading, a plea containing an express denial or renunciation of some claim alleged to have been made by the party pleading. (*b*) The act of one who renounces or refuses to accept a gift or devise made to him of land or other property, and generally to the waiver of any claim. (*c*) In the law of landlord and tenant, a denial by the tenant of the landlord's title, in such a way as to cause a forfeiture of the tenant's estate. (*d*) In patent law, the renunciation of all claim to what is, or appears to be, claimed as a part of his invention by the patentee in his application for a patent.

Revised by F. STURGES ALLEN.

Disco: large island in Davis's Strait off the western coast of Greenland; lat. 69° 11′ N., lon. 53° 20′ W. It belongs to Denmark, is mountainous in character, and has valuable coal mines. On the southern coast is the harbor of Godhavn, the seat of government in Danish Greenland.

Discob'oli [from Gr. δισκοβόλος, quoit-thrower; δίσκος, quoit + βαλεῖν, throw; so called in allusion to the habit of the fish of placing its disk on some firm body]: a group of fishes, containing two or three families, having the ventral fins united to form a sucking disk on the under surface of the body, by which the animal is enabled to attach itself firmly to a rock or other fixed body in order to obtain food. To this group belongs the lumpsucker (*Cyclopterus lumpus*) and the sea-snails (*Liparis*).

Discobolus [for etymology, see DISCOBOLI]: a quoit-thrower; an ancient statue representing a man either holding a circular quoit, but at rest, like one in the Vatican, or in the very act of hurling the quoit, like Myron's statue, of which a copy exists in the Vatican, one in the British Museum, and one of peculiar importance in the Palace Lancellotti at Rome.

Discocepha'li [from Gr. δίσκος, quoit + κεφαλή, head]: a sub-order of fishes in which the anterior dorsal is modified into a sucking disk. This disk is placed on the head, and is composed of laminæ so arranged that by exhaustion of the water the fish is enabled to adhere to larger fishes or to ships, and is thus carried to great distances without effort on its own part. The group contains one family, the ECHENEIDIDÆ (*q. v.*). DAVID S. JORDAN.

Discontinuous Function: in mathematics, a function which does not continuously increase or diminish when the independent variable increases uniformly. The function *tan. x* is discontinuous; for though the arc x increases uniformly from 0° to 360°, *tan. x* changes abruptly from $+\infty$ to $-\infty$ at $x = 90°$ and $x = 270°$.

Discord [from Lat. *discor'dia*, deriv. of *discors*, inharmonious; *dis-*, apart + *cor*, *cordis*, heart]: want of concord; dissension, strife; a combination of sounds which have no harmonical relation. In music, a combination of notes more or less disagreeable to the ear. Discords are largely employed in musical compositions, being introduced by way of transition between successive concords, of which they serve, by contrast, to heighten the pleasing effect. They are therefore indispensable to the highest order of musical expression. The concord preceding a purposely introduced discord is called the *preparation*, and that which follows, the *resolution*.

Discount [O. Fr. *disconter*, reckon off < Lat. *dis-*, from + *computa're*, reckon]: an allowance or deduction made for cash or advanced payments. Thus if a seller allows a discount of 15 per cent. for the prompt or advanced payment of a bill amounting to $250, the purchaser may pay it with $212.50 ($250 less 15 per cent.). Discount is also the amount deducted from the face value of a promissory note, bill of exchange, or the like, in purchasing the privilege of collecting it at maturity. *Bank discount*, the form recognized in business and law, is simple interest paid in advance, and reckoned on the amount of the paper instead of on the amount advanced. *True discount* is such a deduction as to be the interest on the amount advanced. At bank discount a note or bill for $100 due in twelve months, if discounted at 6 per cent., would bring $94. At true discount the same paper would bring $94.34 (computed by dividing $100, the face value, by $1.06, or $1 + the rate).

Discovery: in equity jurisprudence (see EQUITY), the act of disclosure by a defendant of facts to which he is required to answer by reason of a "bill of discovery" which has been filed against him. The court entertains such a bill to secure the due administration of justice. There must be an interest on the part of the plaintiff in the subject to which the discovery refers, and the information sought must appear to be material either to the prosecution of the suit or of some other suit or action then pending or which may be begun. The defendant will not be compelled to make the discovery when disclosure would subject him to criminal proceedings or to a forfeiture. (The works on equity jurisprudence should be consulted for fuller information; those by Story, Adams, Spence, etc.) In a number of the United States, following the lead of the New York code of procedure, the bill for discovery is abolished. Either party to an action under that system may obtain an order from a judge to examine a party to an action before trial. The mode of examination is regulated by rule of court. This proceeding is a substitute for the former bill of discovery.

T. W. DWIGHT.

Discovery of America: See HWEI-SHIN, FUSANG, SAINT BRENDAN, LEIF ERICSSON, VINLAND, NORUMBEGA, MADOC, and COLUMBUS, CHRISTOPHER.

Discovery of Territory: the claim to territory on the ground of discovery, though always somewhat vague in its character, has been a positive source of state aggrandizement since the fifteenth century, and even to-day is not obsolete. In the early days of adventure and discovery mariners sailed along a coast, perhaps up its principal rivers, landed, planted their sovereign's flag, arms, or a cross, and claimed as his territory in consequence the coasts visited and all the country drained by the rivers thus discovered. The rights of the aboriginal inhabitants were of small importance. The whole of the American continent, North and South, the East and West Indies, and large portions of Asia and Africa, were portioned off on the basis of such claims. Original discovery, however, was not enough to found a permanent title to territory, but must have been followed by occupation and "beneficial use." By this latter phrase was meant any wealth-producing employment of the soil or adjacent waters, whether for agriculture, fisheries, or the capture of and trade in furs. The indefiniteness of claims to territory based on such grounds as these, both as to character and extent, naturally brought nations into conflict.

The Oregon controversy is an example. The U. S. laid claim to the Oregon region on the score (1) of Gray's discovery of the Columbia river, Gray being a merchant captain, not a commissioned officer of the navy; (2) of the occupation and beneficial use of territory by Astor's fur-trading posts at Astoria and elsewhere; (3) of Lewis's and Clark's exploration from the head-waters of the Columbia to its mouth; (4) of contiguity to, perhaps inclusion in, the Louisiana purchase; (5) of subsequent extensive immigration into and settlement of that region by citizens of the U. S. It was owing to the last-mentioned fact that the ownership of the Oregon territory was really secured by the U. S.

As a recent example of the acquisition of jurisdiction over unoccupied territory on the ground of discovery may be mentioned the practice of both Great Britain and the U. S. to cover with their protection and law, on certain conditions, those guano islands which may have been discovered and are being worked by their subjects. And at present on the African continent discovery is constantly enlarging the territory claimed by states with colonizing tendencies.

THEODORE S. WOOLSEY.

Disease [O. Fr. *desaise* : Ital. *disagio*, discomfort, inconvenience < Lat. *dis-*, apart + a word meaning comfort, ease, Ital. *agio* : Fr. *aise* : Eng. *ease*; of uncertain origin]: a deviation from a state of health, consisting in most cases (if not in all) in some change, palpable or impalpable, of some one or more of the tissues, rendering such tissue (or the organ containing it) incapable of performing its proper part in the economy of the organism to which it belongs. In a less general sense, a particular form of ill-health

is called a disease. Diseases are either *diathetic* (arising from the diathesis or predisposition of the patient) or *enthetic* (arising from without the patient). It is at present a favorite theory with many that enthetic diseases arise from minute organisms or disease-germs. For the effects of climate upon disease, see CLIMATE IN RELATION TO MEDICINE.

Diseases, Distribution of: See GEOGRAPHICAL DISTRIBUTION OF DISEASES.

Disfran'chisement: the act of depriving a person of any privilege, liberty, franchise, or immunity, such as depriving a member of a corporation of his corporate rights. It is distinguished in this case from "amotion," which refers to the removal of an officer of the corporation from office, without affecting his membership. Another instance is the act of depriving a person of the rights and privileges of citizenship. This term is often applied to the act of depriving a person of the right to vote, and in Great Britain to the act which deprives a constituency of the right to return a member to Parliament. Revised by F. STURGES ALLEN.

Dishonor [from Lat. *dis-*, un- + *honor*, honor]: in mercantile law, the refusal or neglect to pay (or to accept) a draft or a bill of exchange at maturity, or when duly presented for payment. The act of drawing or indorsing such a bill or draft involves the drawer and indorser in an obligation to pay it in case the drawee dishonors the same. In order that the person in whose favor it is drawn may have recourse against the drawer and indorser, it is necessary that notice of the dishonor shall be given to these parties without unreasonable delay. Revised by F. STURGES ALLEN.

Disinfection [from Lat. *dis-*, apart, un- + *inficere*, *infectus*, affect, infect, taint, stain]: strictly, the destruction of the causes of infectious and contagious diseases, disinfectants being the agents employed in the process of destruction. It is now believed that the causes of all infectious and contagious diseases in man and the lower animals are minute organisms, and for a certain number of them—including anthrax, tuberculosis, glanders, malignant œdema, erysipelas, various forms of suppuration, diphtheria, typhoid fever, tetanus, etc.—these organisms have been isolated, identified, and shown to belong to the family of bacteria. For others, including some of those against which disinfection is commonly practiced, such as smallpox, scarlet fever, measles, yellow fever, and typhus fever, the nature of the organism is unknown; but from manifold experience it is inferred that it is destroyed by the same agents that have been shown to be effective against the specific pathogenic bacteria. As employed popularly the word disinfection is quite as often used to denote efforts at the destruction of infection supposed to be present as it is to denote the actual destruction of infective matters in the strict sense of the word; but as there is no other single word which can properly be applied to the use of disinfectants, when, as in the great majority of cases, we do not positively know that the causes of infection are present, but only believe them to be there, this loose employment of the word is likely to continue, and we therefore speak of disinfecting privy vaults, sewage, or the hold of a ship, although in many cases we do not know whether any really infectious matter is thereby destroyed.

Disinfection is accomplished by both thermal and chemical means. Thermal disinfection includes destruction of infection by both hot air and steam, while chemical disinfection implies the destruction of infective particles by the use of substances of a chemical nature. In either case the vitality of the infective agents is destroyed through alterations in the protoplasm composing them by the agent employed. In some cases this involves the decomposition and disintegration of the infective particles, in others they may be simply killed and not otherwise altered.

Sterilization is the killing of all living things, including spores and vegetative forms of micro-organisms, that may be present in a substance or inclosed space, or on a given surface. Sterilization may be said to involve disinfection, for, although a sterilized fluid might contain enough of the specific products of the diphtheria bacillus to produce the pathological results of the disease if injected into the living body, there would be no increase of the virus, and hence the person thus diseased would not convey infection to another. On the other hand disinfection does not always require sterilization, for in a mixture of bacteria containing pathogenic forms many of the latter may be destroyed by means which would have little effect on the spores of some of the non-pathogenic bacteria present.

An antiseptic is a substance which hinders or prevents the growth of micro-organisms, and in its employment is directed especially against those forms of bacteria which cause fermentation or putrefaction, or which give rise to suppuration in the living body.

In certain cases the action of a disinfectant may be limited to the time of its application—as is the case with steam—it kills the living organisms present, but leaves the place or the substance capable of supporting a growth of other living forms that may subsequently gain access to them: while the action of an antiseptic is more permanent, hindering the development of not only the bacteria present but of those added afterward, although it may not kill them. Agents which destroy or mask foul and unpleasant odors are sometimes called disinfectants, but this is an error. It is true that some deodorizers are disinfectants, and *vice versa*, but there is no definite relation between odors and infection, and the absence of the one does not imply the absence of the other. The specific organisms of contagious and infectious diseases differ in their vital properties and powers, so that what will destroy one may not seriously injure another, but in general it may be said that sunlight and the drying action of the air are unfavorable to their development and are nature's chief disinfectants. The action of the oxygen of the air as a disinfectant appears to be often indirect, by favoring the growth of the common ærobic bacteria of nitrification and decay, which either destroy the organic matter required by the pathogenic organisms as food, or develop products which are directly poisonous to such organisms. Cold is the natural disinfectant for yellow fever—the first frost puts an end to an epidemic of this disease, and if cases occur afterward they can be traced to inclosed rooms in which the temperature did not fall to the freezing-point. Even zero temperatures do not destroy the infection of anthrax, of typhoid, of tuberculosis, of smallpox, or of some of the pathogenic micrococci. Disinfection is to be applied to substances and surfaces which are supposed to have become infected, either directly or indirectly, by the presence of specific pathogenic micro-organisms. The process of removing or destroying all micro-organisms on the instruments or hands of the surgeon or obstetrician, or on the skin of a patient to be operated on, is sometimes called disinfection, but it is more properly named sterilization.

In selecting a disinfectant the following points should be considered: (1) its powers as a germicide under different conditions of concentration and length of time required; (2) its liability to produce injury to persons or property; (3) the ease and certainty of its application by unskilled persons; (4) its cost.

The most certain and valuable disinfectant is heat, which may be applied by fire to effect complete destruction by burning, by baking in dry hot air, by steam under slight pressure, and by boiling water. For all articles of clothing and bedding, towels, or other things which can be washed and boiled without injury, this is the cheapest, easiest, and most satisfactory method of disinfection.

The experience of the large laundry connected with the Hospital for Infectious Diseases in Glasgow, extending over fifteen years, has practically proven, what might have been anticipated from laboratory experiments, that the clothing and bedding of smallpox, typhus, scarlet fever, and other similar cases may be freely mingled and passed through the tubs and kettles without risk to subsequent wearers. Simple boiling for fifteen minutes will destroy all known infection except possibly that due to spores, which may require an hour. Even an hour's boiling will not certainly destroy the spores of the hay bacillus, but this is not a disease-producing organism.

Dry heat or baking at temperatures of from 230° to 260° F. or upward is useful for sterilizing articles of metal, glass, crockery, etc., which will not be injured by a little excess of heat, but it is not a good method of disinfecting blankets, mattresses, pillows, etc., although it is still used in many places for that purpose. Dry heat penetrates very slowly into articles having many air spaces and otherwise being good non-conductors, and the degree and duration of heat which is required to destroy spores (245° F. for five hours) is perilously near the temperature which will injure the texture of woven stuffs, and make them either brittle or change their color. Such a degree of heat fixes stains from blood, excreta, etc., so that they can not be washed out, and it is practically impossible to regulate the temperature of a large hot-air chamber so that all parts shall be of a sufficient temperature and yet no part in excess.

For this reason disinfecting ovens are now being replaced by cylinders or chambers into which steam under slight pressure is admitted. It is desirable that the steam should have a temperature of from 220° to 230° F., with a pressure only just sufficient to prevent any deposition of moisture in the chamber, and that it shall be so admitted as to drive out all air from the interstices of the infected articles as well as from the chamber at large, and thus insure its penetration into the interior of mattresses, pillows, etc. The operator should know when this penetration has been effected by the action of a thermometer placed in the interior of the mattress, and by electric connection, sounding a bell when the desired temperature is reached.

It is of advantage in this form of steam sterilizer to have the chamber so arranged that for a period before the steam is introduced hot air can be allowed to enter the chamber, and penetrate the materials to be disinfected. This warms all objects, and prevents condensation of the steam and wetting of the materials in the chamber.

These disinfecting chambers are usually made of boiler iron, and may be fixed or movable. Most large cities in Europe now have one or more disinfecting stations under the direction of the health authorities, and here a steam disinfecting cylinder is so set that its opposite ends open into different rooms in order that the articles which have been disinfected may not be exposed to the dust of a room which has recently contained infected things.

Dust is a most important factor in practical disinfection. Bacteria and spores rarely exist as free particles in the air, but rather as adhering to fragments of carbon, finely pulverized straw, shreds of cotton, etc. They are not given off from the surface of liquids nor from thoroughly moist surfaces, unless with particles of the liquid thrown into the air as a spray. Hence it is of the utmost importance in handling infected articles to keep them moist until they are disinfected. Sheets, underclothing, etc., should be thoroughly moistened, or placed in vessels of water before they are taken from the infected room to the laundry, and mattresses and other articles to be taken to the disinfecting station should be carried in rubber bags.

There are many infected things and surfaces to which heat can not be applied, and for these gaseous or liquid disinfectants are used. Of the gaseous disinfectants sulphurous acid and chlorine are those most used. The air of a sick-room can not be disinfected while the patient is in it. The use of chloride of lime in saucers, or of strips of cloth soaked in carbolic acid, or the burning of pastilles is useless so far as disinfection is concerned.

The removal of infection from walls, floors, and the surfaces of furniture is best effected by thorough rubbing with rags or sponges moistened with solutions of corrosive sublimate 1–1,000, or of carbolic acid 3 per cent., in such a way as to remove all dust, and then boiling or burning the rags. Rubbing walls and ceilings with moist bread crumbs is a good way of removing infectious dust. Especial care is to be taken to remove the dust from all cornices and projecting ledges over doors, and from the tops of wardrobes, etc.

It will usually be found, however, that the walls and wood-work contain cracks, and that to complete the process it will be advisable to employ sulphurous acid, produced by burning sulphur in an iron pot placed on sand. All openings into the room should be tightly closed, and the fumes should be left to fill the room for at least twelve hours. At least 4 lb. of roll brimstone per 1,000 cubic feet will be required, and if the room is not more than usually airtight 6 lb. will be needed. The gas diffuses with great rapidity, penetrating upholstery and clothing, and has little injurious effect upon furniture or woven stuffs. Its efficiency is greatly increased by saturating the air of the room with water-vapor at the time the sulphur is being burned. This is most conveniently accomplished by having several open vessels of boiling water standing at different parts in the room.

It will not destroy spores, and is chiefly useful against the infection of scarlet fever, measles, and smallpox. It should not be relied upon in anthrax, diphtheria, or tuberculosis.

The liquids most useful for disinfecting purposes are common whitewash made with freshly slacked lime, 4-per-cent. solutions of fresh chloride of lime, 5-per-cent. solutions of carbolic acid, and solutions of corrosive sublimate 1–1,000.

The solution used in the Paris disinfection service is composed as follows:

Corrosive sublimate.....	grammes.	4
Tartaric acid.....		48
Distilled water.....		200

A few drops of a 5-per-cent. solution of carminate of indigo are added to give it a distinctive color, and the whole added to 2 liters of water.

Half an ounce of corrosive sublimate to 3 gal. of water and a few grains of anilin blue makes a solution of general utility for disinfecting surfaces of all kinds.

For the disinfection of fæces and of sputa a 5-per-cent. solution of fresh chloride of lime or a 5-per-cent. solution of carbolic acid is recommended. They should be allowed to remain in contact with the excreta for from six to twelve hours. For disinfecting privy vaults and cesspools strong milk of lime is the best. Corrosive sublimate should not be used for the disinfection of excreta or sputa, as it forms an insoluble compound with albuminous matters.

Sulphate of iron is not a disinfectant.

Other chemical disinfectants which are more rarely used are permanganate of potash, chloride of zinc, and various coal-tar products. These, with such substances as iodoform, peroxide of hydrogen, etc., are used for special purposes in medical and surgical practice, but are more costly, more liable to inflict injury, or in other ways are less desirable for general use in disinfection than heat, lime, corrosive sublimate, carbolic acid, chlorine, and sulphurous acid.

For the sterilization of instruments used in surgical operations it is becoming customary to boil them in water containing 2 per cent. of common soda. This method has been shown by experiment to possess much value as a means of disinfection. J. S. Billings and A. C. Abbott.

Disintegration [from Lat. *dis-*, un- + *integra're*, make whole (*in'teger*), renew]: the separation of the integrant particles of a body; the destruction of cohesion; in geology, the gradual wearing away of a rock by ordinary atmospheric action, etc.; the process by which a solid rock is reduced and comminuted to sand, gravel, or soil. Soil or arable land is formed and prepared by the disintegration of rocks. The action of the weather is helped by frequent alternations of temperature above and below the point at which water attains its greatest density—i. e. 39° F.

Disk, or **Disc** [from Lat. *dis'cus*, quoit, plate = Gr. δίσκος, quoit]: in astronomy, the face of the sun, moon, or a planet, such as it appears to us projected on the sky. The forms of the celestial bodies being nearly spherical, their projections are circular planes. The fixed stars, when viewed through a telescope, present *spurious disks*, in consequence of the diffraction of light.

Disk, or Disc, in botany, is a fleshy expansion of the receptacle of the flower; a part of the receptacle, or a growth from it enlarged under and around the pistil; also the central part of a head of flowers of the *Compositæ*, as the *Coreopsis*.

Disk Worship: See Egypt, Ancient.

Dislocation, or **Luxation** [*dislocation* is from Lat. *dis-*, un- + *loca're*, place, deriv. of *locus*, place; *luxation* is from Lat. *luxa're*, to loosen]: in surgery, the displacement of a bone from its proper relation to another bone with which it is articulated. A complicated dislocation is the displacement of a bone, accompanied by a severe local lesion of the soft parts, or fracture of a bone. Congenital dislocations are those which occur before birth. The restitution of a dislocated bone is called its reduction. Reduction of recent luxations is usually a comparatively easy task to those who have the requisite knowledge and experience, but in old and long-neglected cases it is frequently a most formidable operation, and is liable to be followed by bad consequences to the patient.

Dismal Swamp: a great morass in Virginia and North Carolina, occupying the eastern part of the peninsula between Chesapeake Bay and Albemarle Sound. It was originally about 35 miles long and 25 miles wide, but has been diminished by the drainage of its margin and of portions of the interior. A large portion of it is covered with dense forests of juniper, cypress, white cedar, and black gum trees, the lumber of which is exported, while other parts are covered with a dense growth of reeds. West of the middle of the swamp is Lake Drummond, which has an area of about 6 sq. miles, and abounds with fish. A canal through the swamp opens steam communication between Chesapeake Bay and Albemarle Sound, and the Norfolk and Southern Railway runs through the eastern portion. The swamp does not occupy a basin, but is higher in the middle than at its northern, eastern, and southern margins; its highest part is 21 feet above tide-water.

Dispensary [deriv. of verb *dispense* < O. Fr. *despenser* < Lat. *dispensa're*, weigh out, distribute; *dis-*, apart + *pen'dere*, *pensum*, weigh]: a charitable institution in which medical and surgical aid is gratuitously furnished to the poor. During the Middle Ages dispensaries were set up in the houses of the wealthy and in monasteries, and toward the end of the eighteenth century were established in their present form. They are now established in most large cities. The oldest in Great Britain, the Royal General Dispensary, Bartholomew Close, London, was opened in 1770. The oldest in the U. S. was founded in New York in 1795.

Dispensation [from Lat. *dispensa'tio*, distribution, assignment, management; deriv. of *dispensa're*, weigh out; *dis-*, apart + *pendere*, weigh]: in the Roman Catholic Church, an exemption from some canon or other law. Bishops and priests grant dispensations in some cases, but the pope alone has the power of giving them in the more important ones. Papal dispensations were first granted in 1200 by Innocent III. After the English Reformation the dispensing power was assumed by the kings, but it was abolished by the Bill of Rights in 1689. See PARDON.

Dispen'satory [for etymology, see DISPENSARY]: a book containing an account of the physical qualities and medicinal powers of different drugs, with their natural and commercial history, and their preparation and combinations. One of the most complete works of the kind is the *United States Dispensatory*, by Wood and Bache (1833; 13th ed. 1870).

Dispersion [from Lat. *disper'sio*, scattering; *dis-*, apart + *spar'gere*, *spar'sum*, scatter]: in optics, the angular separation of the constituent rays of light when decomposed by the prism. Owing to the unequal refrangibility of the rays of different colors, a beam of light admitted through a small aperture in the shutter of a darkened room, and refracted by passing through a prism, forms an elongated image or spectrum; the red rays, which are the least refracted, occupying one end of the spectrum, and the violet rays, which have the greatest refraction, the other end. The rays after refraction are no longer parallel, so that the index of refraction (the ratio of the sine of the angle of incidence to the sine of the angle of refraction) is different for each ray; and the difference of the indices for the extreme rays is called the dispersion of the light. The amount of dispersion varies with the angle of the prism and the material of which it is composed. On the latter, too, depends the relative breadth of two parts of the spectrum, or irrationality of dispersion. It had been supposed by Sir Isaac Newton that the dispersion was proportioned to the refraction, but it was soon found that although the colors in spectra formed by prisms of different substances are always arranged in the same order, they do not occupy the same relative amount of space; a prism of flint-glass giving, in proportion, less red and more violet than a prism of crown-glass, and that substances for which the index of refraction of the middle ray of the spectrum is nearly the same, produce spectra of different lengths.

Disposition [Lat. *dispositio*, from *disponere*, dispose, put in order, arrange]: in architecture, one of the six essentials of the art. It is the arrangement of the whole design by means of the ichnography (plan), orthography (section and elevation), and scenography (perspective view), and differs from *distribution*, which signifies the particular arrangement of the internal parts of a building.

Disraeli, diz-ray'li, BENJAMIN, Earl of Beaconsfield: statesman and novelist; b. in London, Dec. 21, 1804; of Jewish extraction; educated by his father and private teachers. He entered a solicitor's office, but had no taste for legal business, and finally took to literature. His principal novels are *Vivian Gray* (1826); *The Young Duke* (1830); *Contarini Fleming* (1832); *Henrietta Temple* (1836); *Coningsby* (1844); *Lothair* (1870); and *Endymion* (1880), some of which were successful—not so much on account of any great literary merit as on account of their close reference to actual circumstances. He began his political career as a Radical, and offered himself as a candidate for Parliament in 1831, but was defeated. Having become a Tory, he was again rejected by the electors of Taunton in 1835, but was elected a member of Parliament for Maidstone in 1837. His maiden speech was so pretentious, and uttered with gestures so extravagant, that he excited the laughter of the House, and closed abruptly, saying, "I shall sit down now, but the time will come when you will hear me." He married in 1839 the widow of Wyndham Lewis. Having gradually acquired skill as a debater, he became, about 1842, the leader of the "Young England Party" and an opponent of Sir Robert Peel, whom he denounced with unsparing invective because Peel advocated the repeal of the corn-laws. In 1846 he was returned to Parliament for Buckinghamshire, which he represented for many years. He succeeded Lord G. Bentinck, who died in 1848, as leader of the Protectionist party in the House of Commons. He was Chancellor of the Exchequer in the Conservative ministry of Lord Derby for nearly nine months in 1852. About the end of that year he resumed the post of leader of the opposition in the House of Commons. Early in 1858 he was again appointed Chancellor of the Exchequer in the new Conservative Derby-Disraeli ministry. In 1859 he introduced a bill for parliamentary reform, which was rejected by a majority of the House of Commons. He therefore resigned with his colleagues in June of that year. He opposed the electoral Reform bill of Russell and Gladstone, which was defeated in June, 1866. The Liberal ministers then resigned and the Conservatives formed a new cabinet, in which Disraeli was Chancellor of the Exchequer. He also became the leader of the House of Commons, and the most prominent minister except the Premier, Lord Derby. He was the principal author and manager of the Reform bill which became a law in Aug., 1867, and extended the right of suffrage to every householder in a borough. This bill enfranchised nearly a million of men, mostly workingmen, and was considered a dangerous innovation by the Conservatives. Disraeli succeeded Lord Derby, who resigned the place of Prime Minister in Feb., 1868. He opposed the resolutions or bill which Mr. Gladstone introduced to disestablish the Irish (Episcopal) Church. After a long debate, Mr. Gladstone's resolutions were adopted by the House of Commons on May 1, 1868, by a majority of sixty-four. Disraeli, though defeated on this important question, resolved not to resign office, but to wait for the result of the general election, which occurred in the next November. The Liberal party having secured a large majority in the new Parliament, he and his colleagues resigned Dec. 2, 1868, and Mr. Gladstone then became Prime Minister. He was chosen lord rector of the University of Glasgow 1873, and was Prime Minister again 1874–1880. During this his last term of power he was principally occupied with the foreign policy of the country. Among the characteristic measures of his ministry were the creation of the title Empress of India, the establishment of the "scientific frontier" between Afghanistan and the Russian possessions in Central Asia, the acquisition of Cyprus, and the subjugation of the Zulus. D. in London, Apr. 19, 1881. See his *Selected Speeches* (2 vols., 1882); *Life*, by Hitchman (3d ed. 1884); Brandes (1879); O'Connor (hostile, 1879); Kebbel (1888); Froude (1890).

Disraeli, ISAAC: English author; father of Benjamin Disraeli; b. at Enfield in May, 1766. He studied in Amsterdam and Leyden, and spent some years in France. Inheriting a fortune from his father, a Hebrew merchant originally from Venice, and belonging to one of the Jewish families who escaped to Venice from the Inquisition in Spain in the fifteenth century, he devoted himself to the study of literary history. His principal works are *Curiosities of Literature* (1790); *Calamities of Authors* (1812); *Quarrels of Authors* (1814); and *Amenities of Literature* (1841). D. at Brandenham House, Buckinghamshire, Jan. 19, 1848.

Disruption [from Lat. *dis-*, asunder + *rum'pere*, *rup'tum*, break; cf. *dīrup'tio*, *dīrum'pere*]: the schism in the Church of Scotland in 1843. See FREE CHURCH OF SCOTLAND.

Dissection: See ANATOMY.

Dissection Wounds: See WOUNDS.

Disseizin, or **Disseisin** [O. Fr. *disseisin*, deriv. of *desseisir* > Mod. Fr. *dessaisir*, disseize; *dis-*, *des-*, away + *saisir*, take, seize]: in law, an unlawful ejection of one who is seized of a freehold in lands, so as to deprive him of the SEISIN (*q. v.*) and place it in another. The modern equivalent for this word is "adverse possession." There is also "disseizin by election," where a person chooses to consider himself disseized, though he is not so in fact, in order to avail himself of legal remedies applicable to a true disseizin.

Dis'sen, GEORG LUDOLPH: classical scholar; b. Dec. 17, 1784, near Göttingen; a pupil of the philologist Heyne and the philosopher Herbart; professor in Göttingen from 1813 till his death. Having occupied himself in his earlier years with grammatical and philosophical investigations

(especially of Plato), he afterward devoted himself exclusively to æsthetical exegesis of the classics, laying special emphasis upon the development of rigid stylistic laws, which he contended governed all poetical and oratorical composition among the ancients. This new doctrine, though at bottom a sound one, was carried by its inventor to an unwarranted extreme in his successive commentaries on *Pindar* (1830); *Tibullus* (1835); and Demosthenes's *De corona* (1837). See Dissen, *Kleinen Schriften* (Göttingen, 1839), and Bursian, *Gesch. der class. Philologie in Deutschland*, p. 751 ff.
D. Sept. 21, 1837. ALFRED GUDEMAN.

Dissenters [deriv. of *dissent*, from Lat. *dissenti're*, differ in opinion; *dis-*, apart + *senti're*, think]: English Protestants who differ in their views from the Church of England. This party originally represented the desire for a more radical reform than that introduced by the Anglican Church, and was divided into the Puritans and the Separatists, the former of whom expected to reform the Church from within, while the latter resolved to leave its communion. The Acts of Uniformity in the reigns of Edward VI. and Elizabeth had the effect of alienating both these groups, and, in spite of severe penalties, the Puritans followed the Separatists in withdrawing from the Church. The tyrannical institutions of the Ecclesiastical Commission (1583) lessened the hope of reconciliation, and the repressive enactments of the Stuarts served to embitter the nonconforming Protestants without suppressing the practice of their faith, till the tables were turned in the civil war and left Puritanism in the possession of the government. Another Act of Uniformity, passed after the Restoration (1662), caused the secession of about 2,000 clergymen, who in a restricted sense of the term have been called the Dissenters. All who refused to take the oaths of allegiance and supremacy, and the Eucharist according to the rites of the Established Church, were excluded by the Test Act (1673) from Government employment. By the Toleration Act (1689), Dissenters obtained legal security in celebrating their worship, and the Corporation and Test Repeal Act (1828) enabled them to accept public employment without taking the Eucharist. In 1836 they were first authorized to solemnize marriages in their own places of worship or at a registrar's office. The General Body of Protestant Dissenting Ministers of the Three Denominations is the official name of the union of the three boards of the Presbyterian, Independent, and Baptist ministers resident in and about the cities of London and Westminster. This union was organized July 11, 1727, and has always taken a leading part in the struggle for the disestablishment of the Church of England. In some European countries Dissenters are called Dissidents. See also NONCONFORMISTS and SEPARATISTS.

Dissepiments [from Lat. *dissæpimen'tum*, partition, deriv. of *dissæpi're*; *dis-*, apart + *sæpi're*, hedge in, fence]: in botany, the partitions formed in the ovary by the united sides of the cohering carpels. Sometimes dissepiments meet in the center, and divide the ovary or the fruit into cells; in other cases they are partial, and leave the ovary one-celled.

Dissidents: See DISSENTERS.

Dissociation, or **Disassociation** [*dissociation* is from Lat. *dissocia're*, disrupt the companionship of; *dis-*, apart + *so'cius*, companion]: in chemistry, the resolution of more complex molecules into simpler ones by the action of heat; also called thermolysis.

The word was first introduced into chemical nomenclature by Henry St. Claire Deville, who presented a paper to the French Institute Nov. 23, 1857, *On the Dissociation or Spontaneous Decomposition of Bodies under the Influence of Heat.* Deville says in this paper: "When heat acts upon any body it produces an expansion which we attribute to a force called the repulsive force of heat. By selecting a proper compound and heating it sufficiently, the distance between the molecules can be increased to such an extent that they will separate into their elementary condition. This is a spontaneous decomposition not determined by any chemical action. I propose to call it the *dissociation* of compound bodies."

A very full discussion of the subject of dissociation by Mène may be found in the *Revue Hebdomadaire de Chimie*, vol. iii., 1871. See also the researches of Graham, Debray, Grove, Regnault, Lamy, Isambert, Frankland, and Clausius.

Dissolving Views: enlarged images of transparent pictures thrown upon a screen by means of two magic lanterns placed side by side, with their lens tubes a little convergent, so that the projected images may be superposed. By means of mechanical contrivances, which differ in different forms of the apparatus, one of the images is gradually extinguished while the other is similarly developed. At the middle point the two are confusedly intermingled, and afterward one seems to swallow up the other. See MAGIC LANTERN.

Dis'sonance [from Lat. *dissonan'tia*; *dis-*, apart + *sona're*, to sound, deriv. of *so'nus*, sound]: the opposite of *consonance*; those intervals in music whose relative proportions are unsatisfactory to the ear. In a special sense, the term is applied to a dissonant interval purposely introduced by the addition of a dissonant note to a concord, or by the substitution of a dissonant for a concordant note.

Distaff [O. Eng. *distæf* = *disestæf*; for former element cf. Low Germ. *diesse*, bunch of flax on the distaff, of which noun *dizen*, to deck out, represents a derivative; the latter element is Eng. *staff*]: one of the earliest and most simple implements used in spinning, consisting of a stick with a cleft or pronged end, around which the fiber to be spun was wound. The distaff was usually held under the left arm, a spindle was attached to the end of the thread and set rotating, and the thread as it was drawn out rapidly by the right hand wound itself around the spindle. When the small wheel used for spinning flax was invented the distaff was attached to it. The Fates are represented as spinning the thread of life from the distaff. The distaff is at present not much used except in rude and barbarous countries; but no spinning-wheel, much less any machinery driven by water or steam, has ever produced work which can compare in delicacy with the finest products of the distaff.

Distance: in music, the interval between two notes; in astronomy, real distance is an interval between two heavenly bodies expressed in terrestrial measures, as miles, meters, etc.; mean distance is a mean between the perihelion and the aphelion; curtate distance of a planet is the distance from the sun or earth to that point where a perpendicular let fall from the planet meets with the ecliptic. Line of distance in perspective is a straight line from the eye to the principal point of the plane. The point of distance is that point in the horizontal line which is at the same distance from the principal point as the eye is from the same. Distance in navigation is the number of miles from point to point in a ship's course. The arc of a rhumb line between two places is the nautical distance. Distance in horse-racing is the last 250 yards of the course. Any horse not reaching the distance-post before the winning horse has reached the end of the course is said to be distanced.

Distemper (in Fr. *détrempe*; Ital. *tempera*): a method of painting in which the pigments are ground up with size and water, white of egg with gum-water, or similar vehicles. It is employed in scene-painting and in the preparation of wall-paper. Distemper was the ordinary method of painting in the higher departments of art before the invention of painting in oil. The rapidity with which the vehicle dries renders it difficult to blend the tints in distemper.

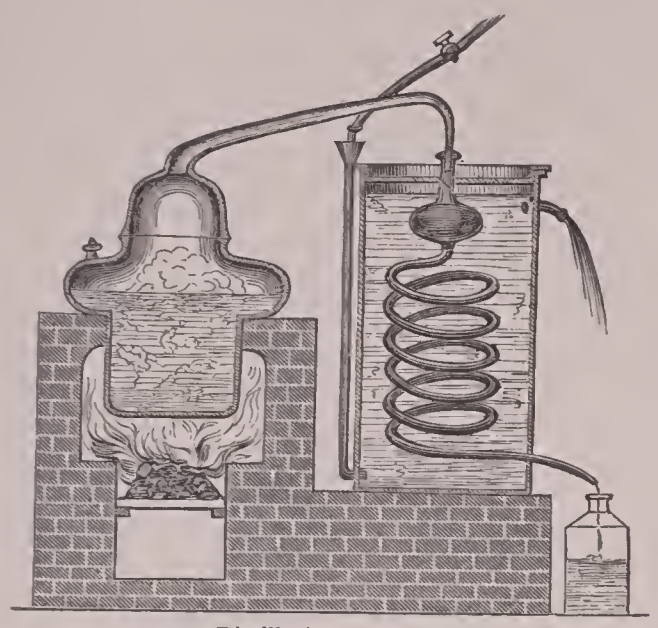
Distemper: the name of certain diseases of animals. See DOG DISTEMPER, and HORSE DISTEMPER.

Disthene: See CYANITE.

Dis'tich, dis'tik [Gr. δίστιχον; δι-, double + στίχος, row, verse]: a couplet of verses. In the Greek and Latin languages the distich consists of a hexameter followed by a pentameter verse. It was much used by the Greeks and Romans in the expression of single thoughts and sentiments, and in the composition of epigrams.

Distillation [from Lat. *destilla'tio*, a dripping or oozing down; deriv. of *destilla're*; *de*, off + *stilla're*, to drop, cf. *stilla*, a drop]: in chemistry and the arts, a process by which substances which are vaporized at different temperatures are separated from each other, or substances which can be vaporized are separated from those which can not. When the vaporized substance assumes a solid form after distillation, the process is called "sublimation." Distillation is usually performed by means of a boiler for raising the vapor, and a condenser for reducing the vapor to a liquid or solid form. The condenser is often a spiral tube or "worm," which is kept cool by water while in use. Various instruments for distilling are used in the laboratory of the chemist. "Dry" or "destructive" distillation is the production of new compounds by submitting substances of organic origin to a high but carefully regulated heat. These products are often complex, but sometimes perfectly definite. "Fractional" distillation is the separation of one volatile

substance from another, by collecting the parts that pass over at different temperatures in different vessels, and afterward distilling each of the fractions a number of times.



Distillation process.

To produce spirits two distinct operations are required: one to convert vegetable principles into alcohol; the other the separating of the alcohol from the several substances with which it is united while being produced. Sugar is the principle which is necessary to the formation of alcohol, and is used *directly* when molasses and similar saccharine products are submitted to quick fermentation; and *indirectly* when sugar is produced from the starch which certain grains contain, and afterward converted into alcohol. The latter method is commonly employed in distilleries, and grains of various kinds, generally with some malt, are *mashed*. To accomplish this result, a mixture is made of the ground grain and crushed malt, and infusion made in hot water, constantly shaken in the mash-tub, which is best made of circular cast-iron plates, after which the wort is run off and water added until the soluble matter of the grain is extracted. While in process of mashing, sugar is formed from the starch, and changes into alcohol while fermenting; the mash gradually becomes thinner in consequence, and as soon as the proper state is reached, which the hydrometer determines, in order to prevent acetic fermentation it should be distilled. See WHISKY for full account of its distillation.

Much skill and care in mashing, fermentation, and distilling is necessary to the successful production of the greatest possible amount of alcohol from a given quantity of grain, fruit, or other raw material. According to Hermstadt, about 51 lb. of alcohol and 49 of carbonic acid may be obtained from 100 lb. of sugar; 100 lb. of starch yield 35 lb. of alcohol, and the same quantity of the following grains yields a spirit containing 45 per cent. of alcohol—namely, wheat, 40 to 45 lb.; rye, 36 to 42; barley, 40; oats, 36; buckwheat, 40; maize, 40. Revised by IRA REMSEN.

Distilled Water (in Lat. *aqua destillata*): the condensed product obtained by the distillation of water, which separates from it all saline matter and impurities, and also most of the air which it had previously contained. On this account it is flat and vapid to the taste. It is much used in chemical and pharmaceutical operations. In some points on the Gulf Coast of the U. S., as at Brazos Santiago, Tex., where streams are unknown and springs scarcely exist, water is procured for drinking and other economical purposes by distillation from the sea. On some sea-going steamers the product of the condensers of the low-pressure engines is utilized for cooking, washing, etc.

Distillery: an establishment fitted up with apparatus for the distillation of spirits. See DISTILLATION.

Distress, or **Distrain**: in English law, the taking of a personal chattel without process of law out of the possession of a wrong-doer, by way of pledge for redress of an injury or for the performance of a duty, as for non-payment of rent or taxes, etc.

Distribution of Species: See ZOÖLOGICAL GEOGRAPHY.

Distributive Co-operation: See CO-OPERATION.

District [Fr. *district* (doublet of *détroit*), territorial division, from Lat. *destrictus*, past partic. of *destrin'gere*, draw away from]: a territorial division: a defined portion of a state or city, which is divided into districts for judicial, fiscal, or elective purposes. The U. S. are divided by the Federal Government into judicial districts, for each of which there is created a district court (see COURTS). Each State having a sufficient population is divided into congressional districts, which are nearly equal in population, and elect each one member of Congress. By the census of 1890, the population of a "district" is to be 173,901; the number of districts is 356. The ratio is raised after each census, in order that the number of members in Congress may not become inconveniently large. Each State is, by the Constitution, entitled to at least one representative, though its population may not equal the prescribed number for a district. Nevada, with less than 50,000 inhabitants, has one representative, and Delaware, with less than 170,000, also has one. But each of these States has two Senators. Every State is also divided into senatorial districts, each of which sends a member to the Senate of that State. There are also tax districts, land districts, etc. Townships in many parts of the U. S. are divided into school districts, each of which maintains and manages one or more public schools.

District Attorneys of the United States: the officers appointed to act as attorneys for the U. S. in the several judicial districts. Formerly, in Great Britain, a district of country embracing several counties was assigned to a judge, in which he held criminal courts called over and terminer—to "hear and determine"—as is still done in some of the U. S. An attorney to represent the crown or state was necessary to enter upon trials. As he was selected to proceed through the whole district, he received the appellation of "district attorney." In the Federal courts, and in many of the States, the duties of this officer have become local, confined to a particular county or place of holding a single court, and the officer is called district attorney, as being the attorney appointed for that district only. It is the duty of the district attorney of the U. S. to prosecute in his district all delinquents for crimes and offenses cognizable under the authority of the U. S., and all civil actions in which the U. S. are concerned, and, unless otherwise directed by the Secretary of the Treasury, to appear in behalf of revenue officers against whom proceedings are pending to recover money exacted by them and paid into the treasury. The office is much sought, both for the honor attached to it and for the profit arising from it. The district attorneys, with two exceptions, receive a nominal salary of $200, and the residue of their compensation is mainly derived from fees prescribed by act of Congress. The amount of the fees and emoluments which may be retained by a district attorney is limited by law to $6,000 over and above the necessary expenses of his office. When they defend officers and others at the instance of the Government, their remuneration is not regulated by law, but depends upon agreement. The district attorneys are under the direction of the Attorney-General, and must render to him an account of their official proceedings, and the state and condition of their offices, at such time and in such manner as he may direct. Revised by F. STURGES ALLEN.

District Courts of the United States: See COURTS.

District of Columbia: since 1800 the seat of government of the U. S.; bounded N., N. W., E., and S. E. by Maryland, and W. and S. W. by the Potomac river and Virginia. Area, 70 sq. miles. Originally its area was 100 sq. miles, consisting of a tract lying on both sides of the Potomac, 10 miles square, ceded to the U. S. by Maryland and Virginia 1788–89. The Virginia portion, with the city of Alexandria, was retroceded to Virginia by Congress July 9, 1846.

The soil of the District is a light sandy loam, well watered in most parts. It belongs geologically to the Cretaceous formation, with deposits of marl underlaid by gneiss, the surface exhibiting sandstone, limestone, pebbles, clay, gravel, sand, and loam.

The fauna and flora are generally identical with those of Eastern VIRGINIA and MARYLAND (*qq. v.*). The Potomac river abounds in shad, herring, black bass, perch, rockfish, sturgeon, etc.

Climate.—The temperature has a wide range, suddenly rising or falling many degrees, but the climate is as equable as is common in the Atlantic States, and generally healthy, though miasma prevails near the Potomac flats. The mean temperature of summer is 76°, of winter 36°, and of the whole year 56°. Average rainfall, 90 inches a year.

The snows of winter rarely lie long on the ground. Storms seldom last twenty-four hours.

Manufactures are limited. According to the census of the U. S. for 1900, they comprised 2,754 establishments, with a capital of $41,981,145, giving employment to 24,693 persons, at an annual wage of $14,643,714. The cost of materials was $19,369,571; the value of products, $47,667,622. Building trades showed the largest aggregate product, $11,521,077; next, printing and publishing, $1,846,535.

Finances.—The assessed value of real estate and personal property in the District in 1899 was $190,958,987. By law one-half the total expenditure for the District of Columbia is borne by the general Government, the other half being taxed on private property. The net public debt of the District was $15,891,620.18, mainly created by the vast street improvements carried out by the short-lived territorial government and board of public works in 1871–74.

Railways.—All the street railways are operated by underground electric power. The Balt. and Ohio and Balt. and Potomac (branch of the Pennsylvania), the Southern, Chesapeake and Ohio, Sea Board Air Line, Atlantic Coast Line, Norfolk and Western, and Chesapeake Beach afford ready transit to the North, South, and West.

The commerce of the District is trifling, though Georgetown is a port of entry, and the Potomac is navigable for large vessels to the navy-yard on the east branch, and to the head of tidewater at Georgetown.

Banks, etc.—In 1901 there were 12 national banks, capital, $3,027,000; circulation, $1,330,525; and deposits, $18,760,598.95; 4 loan and trust companies, capital, $4,450,000; deposits, $11,363,117.52. There are 12 fire-insurance companies, capital, $1,625,000; assets, $3,218,452.

Education.—The public schools of the District have an enrollment of 45,560 pupils, with average attendance of 34,032. Amount expended for free schools, 1899, $1,148,850.36, of which $801,016.26 was for teachers' salaries. Private schools for both sexes are numerous and well attended. There are 7 universities or colleges, with 432 instructors and 2,875 students. Georgetown College, founded in 1789 (Roman Catholic), Columbian University (1814), and Howard University (colored) have each law, medical, and collegiate departments. The Smithsonian Institution (*q. v.*) and the National Museum, erected in 1880, are free public institutions with extensive exhibits in natural history, ethnology, etc. There are 55 Government, society, and school libraries, and a public library, numbering 1,695,525 volumes.

Government.—A territorial government was created by Congress for the District of Columbia in 1871, repealing the charters of the cities of Washington and Georgetown, and merging them into the same government. This was abolished in 1874, and the affairs of the District, including those of Washington, are now managed by three commissioners under the direct legislation of Congress for the levying and disbursement of taxes and for all public improvements. The citizens have no vote, either in District or national affairs. Justice is administered by a Supreme Court of the District of Columbia, having six judges, a Court of Appeals composed of three judges, and by a police court, presided over by two judges.

Pop. (1880) 177,624; (1890) 230,392; (1900) 278,718. For fuller information, see Washington, city of.

Distri'to Federál (that is, the federal district): a reservation about the national capital in federal governments in Latin America. The example was set in the District of Columbia. It was later adopted in Mexico, where the distrito federál embraces the city of Mexico, and has an area of 463 sq. miles and a population of 798,480. The distrito federál of Venezuela embraces Caracas, has an area of 45 sq. miles and a population of about 72,000; this includes Caracas. The municipio neutro of Brazil, embracing Rio de Janeiro (*q. v.*), is a modification of the same idea. The present constitution of Brazil provides for a national reservation in the geographical center of the country, which shall at some future time serve for the seat of the capital.

M. W. Harrington.

Disulphide: See Carbon Bisulphide.

Ditch, or **Fosse** (in Lat. *fossa*): in fortification, a deep trench or excavation around a fort, serving as an obstacle to the enemy and supplying earth for the parapet or rampart. It is generally dry, but is sometimes filled with water. In permanent works, such as the regular fortifications of a town, the rampart and ditch are the most important; the former being beside the latter, and formed of earth excavated from it. The ditch is often 100 feet wide, and 12 feet deep below the natural level of the ground.

Dith'yramb [Gr. διθύραμβος, a form of Greek lyric poetry; etymol. obscure]: a kind of lyric poem sung in honor of Bacchus. It was invented by Arion, in Corinth, about 620 B. C., according to Herodotus. It was of a lofty but often inflated style; hence the term *dithyramb* is frequently applied to any lyric of a boisterous character, such as might be supposed to be composed in a state of intoxication.

Ditmarschen, or, as its Scandinavian name reads, **Ditmarsken**: a district of Western Holstein stretching along the North Sea from the mouth of the Elbe to the mouth of the Eider, and comprising an area of about 500 sq. miles, with a population of (1887) 77,347; its original name was *Thiatmaresguho*—that is, "Dietmar's Gau." At present it forms no independent community; it is merely a portion of the Prussian province of Holstein. It was inhabited by Frisians in the two coast-marks, Norderstrand and Süderstrand, and by Saxons in the two inland marks, Norderhamme and Süderhamme: but a strongly marked community in all the principal conditions of life seems very early to have obliterated the tribal differences. Charlemagne claimed authority over the country and conferred the authority upon the Archbishops of Bremen, but some form of self-government had already developed in that corner of the world, and the pretensions of the archbishop remained mere vain-glory. The Danes defeated the Ditmarschers toward the close of the twelfth century, and the country became a part of Holstein under Danish rule (1559), but continued to preserve much of its local independence. It was annexed to Prussia, with the rest of Holstein, as a consequence of the war of 1866.

Dittany [O. Fr. *ditain, dictame*: Ital. *dittamo* < Lat. *dictamnum* = Gr. δίκταμνον, a plant said to be so named because it grew on Mt. Dictè, in Crete]: a plant of the genus *Dictamnus* and family *Rutaceæ*, with the calyx five-partite, five petals, unequal, ten stamens, and five one to three seeded follicular capsules. The *Dictamnus fraxinella* (*ruber* or *albus*) is a perennial indigenous in Southern Europe, and is often cultivated in gardens. It has red or white flowers, of a powerful spicy fragrance. In the U. S. the dictamnus is often called gas-plant, and the name dittany is given to the *Cunila mariana*, of the order *Labiatæ*. It is probable that the dictamnus of the ancients was the *Origanum dictamnus*, a labiate plant to which the old authors ascribe the most marvelous powers.

Dittéah: same as Datíya (*q. v.*).

Dit'ton, Humphrey: mathematician; b. at Salisbury, England, May 29, 1675; was minister of a Dissenting church at Tunbridge. He was befriended by Sir Isaac Newton, who procured his appointment as mathematical master of Christ's Hospital. He wrote able works entitled *Laws of Nature and Motion* (1705); a *Treatise on Fluxions* (1706); and *Synopsis Algebraica* (1709). D. Oct. 15, 1715.

Diu: an island of India, in the Arabian Sea, near the coast of Guzerat; has a fortified seaport, Diu, with a tolerably safe harbor and the remains of a famous Hindu temple (see map of North India, ref. 8–B). It has been possessed by the Portuguese since 1515. Area, 62 sq. miles; pop. 12,700.

Diuretics: medicines which promote the secretion or discharge of the urine. They are used in certain stages of kidney diseases, in affections of the urinary passages, and in rheumatism, gout, and dropsy. Their action, though useful, is lacking in certainty, and depends upon various conditions, such as the state of the kidneys themselves, the condition of other organs, and the surroundings of the patient.

Divan' [from Arab. *dīwān*, council, court of justice or of revenue, sofa, perhaps viâ Fr. *divan*; viâ Romance the word appears in Ital. *dogana* : Fr. *douane* : Span. *aduana*, custom-house]: a word common to several Oriental languages. It is employed by the Persians to denote a collection of poems by one author, as the divân of Saadi and the divân of Hafiz. The term is also applied to a muster-roll or military day-book. The Turkish divan is the great council of the empire or supreme judicial tribunal. The word *divân* is also among the Turks a common appellation for a saloon or hall which serves for the reception of company, and along the sides of which are arranged low cushioned seats or sofas.

Diver: any bird of the genus *Colymbus* and family *Colymbidæ*. The bill is straight, strong, and pointed, tail and

wings short, and the toes webbed. They dive with great facility, and pursue the fish on which they live under the water. The principal species are the Loon (*q. v.*) or great northern diver (*Colymbus glacialis*), the black-throated diver (*Colymbus arcticus*), and the red-throated diver (*Colymbus septentrionalis*). The name is also popularly applied to numerous aquatic birds, such as the grebes and auks.

Revised by F. A. Lucas.

Divers: persons who make a business of diving, as in fishing for pearls, sponges, etc., in blasting and other engineering operations under water, and in the recovery of sunken property. (See Pearl-fisheries.) In the fisheries, divers still work largely without mechanical aid, although the Diving-dress (*q. v.*) is employed to some extent. Another important device employed by divers is the Diving-bell (*q. v.*).

Divertimen'to, or **Divertissement**, dĕĕ'vār'tēēs'maṅ' [*divertimento* is the Italian and *divertissement* the French word for diversion]: a kind of musical composition arranged for one or more instruments. It has generally no fixed character, and may be classed between the *étude* and the *capriccioso*. The term is also applied to a ballet, or songs introduced between the acts of an opera.

Divide: See Basin and Valleys.

Dividend [from Lat. *dividen'dus*, to be divided, fut. pass. partic. of *divi'dere*, divide]: in arithmetic, the number or quantity given to be divided; also the sum apportioned to creditors from the realized assets of a bankrupt's estate, the annual or half-yearly interest on the public funds or national debt, and the distributed profits of joint-stock companies, which are paid annually or half-yearly to each stockholder.

Dividers: instruments for "dividing" or marking off distances, or for drawing circles, ellipses, and other curves. They sometimes consist of two or even three bars or legs, joined at one end by a hinge. Sometimes two movable points are arranged to slide along a "beam" or straight bar. "Proportional dividers" are made of bars crossing each other and pointed at both ends. By means of a sliding joint at the point of union, dimensions included between one of the pairs of the points may be made greater or less than those included between the other at the same time in any proportion.

Dividing-engine: a machine for marking the divisions of scales of measurement in scientific, mathematical, and astronomical instruments. Scales for mechanics' work were formerly divided by hand, but it is impossible to attain accurate results by such methods, while by a carefully made engine a most surprising degree of precision is reached. The dividing-engine depends primarily for its accuracy upon the degree of precision attainable in the cutting of a steel screw. The most remarkable screws as yet constructed are probably those in two dividing-engines designed by Prof. Rowland. They are used in the ruling of diffraction gratings for optical work. Test-plates for the microscope have been ruled by Mr. F. Nobert, of Barth, Pomerania, with divisions only $\frac{1}{240000}$ of a French inch apart. See Ruling-machines.

Divi-divi, dee'vĕe-dee'vee (*Cæsalpinia coriaria*): a leguminous shrub of tropical America; valued for its pods, which contain tannin and gallic acid. It grows 20 feet high, and the pod is 3 inches long. It is used principally for tanning leather and dyeing cloth, and large quantities are exported from Savanilla, Rio Hache, and Maracaibo.

Divina Commedia, or **Divine Comedy**: See Dante.

Divination [from Lat. *divina'tio*, deriv. of *divina're*, prophesy, have divine (*divi'nus*) foresight]: the art of foretelling events by superstitious experiments, etc., by observing the flight of birds, the planets, clouds, and also by the alleged influence of spirits. Among the ancient Romans divination was practiced in various forms, and is supposed to have originated among the Etruscans. The Israelites were forbidden by the law of Moses from performing divination of any kind. Among the ancient Greeks divination was extensively practiced, but it flourished especially in Chaldæa and Egypt. It was not confined to ancient races, however, nor to the East, for throughout the Middle Ages various arts of divination were commonly practiced in Europe. See Astrology, Horoscope, and Augur.

Divine Right of Kings: the doctrine, probably of very ancient origin, that a monarch was the immediate representative of Deity, by whom alone he could be held responsible for his actions. It would appear that the idea was gradually developed out of the principle of authority that prevailed in the Roman Catholic Church, the power of whose rulers was derived from above, and we find the divine authority of the civil magistrate asserted throughout the Middle Ages. In the great papal-imperial struggle the divine nature of the emperor's authority was maintained by Ghibelline writers, and Dante's *De Monarchia* reveals the dream of a new world emperor ruling by the grace of God, but the idea was not systematically advocated till the time of the Stuarts in England. The most complete exposition of the theory is to be found in Sir Robert Filmer's *Patriarcha*. Hobbes and other prominent writers supported it. Among its opponents were Milton and Algernon Sidney.

Revised by F. M. Colby.

Diving-bell: a hollow, bell-shaped chamber, open at the bottom, used by divers to descend into deep water for the purpose of conducting various subaqueous works or explorations. A kind of kettle is said to have been used by divers in the time of Aristotle. John Taisnier (b. 1509) makes in his works the earliest mention of the practical use of the diving-bell in Europe. In 1665 it was used to raise portions of the Spanish Armada. Though of clumsy dimensions and imperfect in the manner of supplying air, it was similar in construction to those of the present day. Dr. Halley's plan for supplying fresh air was introduced about 1715. His diving-bell consisted of a wooden chamber open at the bottom, where it was loaded with lead to keep it perpendicular in its descent. Light was admitted through glass set in the upper part. Air was supplied by means of a hose attached to casks filled with air and weighted with lead, which were let down lower than the bell. In the year 1779 Smeaton first applied the diving-bell to engineering purposes, and in 1788 he contrived to supply it with air by the use of the force-pump. He constructed a diving-bell of cast iron, shaped like a square chest, its greatest thickness being at the lower part, that it might not overturn. It sinks by its own weight, and affords room for two men, being 4½ feet long, the same in height, and 3 feet wide. This construction of the diving-bell gives those within it no power to raise or sink it. The blows of a hammer on the inside of the bell can be heard by those above the water, and in this manner the divers communicate with the assistants by a series of concerted signals. On account of the cumbrousness of this apparatus, it is little used except for heavy works of subaqueous engineering. For most operations carried on beneath the water a submarine armor or diving-dress is employed.

Diving-dress: a waterproof dress worn by divers, enabling them to walk and work under water. An aquatic armor, consisting of a leather dress and a helmet, is described in Schott's *Technica Curiosa*, published in 1664. An india-rubber cloth diving-dress was invented subsequently, with a metal helmet having in front pieces of plate-glass. Attached to the helmet are two tubes—one to admit fresh air in the same manner as for the diving-bell, the other to carry off the waste air. Leaden weights are attached to the diver, enabling him to descend and walk about. Communication can be carried on with those above by means of a cord running between the diver and the attendants. The diving-dresses in use at present make the diver independent of any connection with persons above the water. They are elastic and hermetically closed. The diver carries upon his back a reservoir containing air compressed to thirty or forty atmospheres, which is supplied to him for breathing by a self-regulating apparatus at a pressure corresponding to his depth. When he wishes to ascend, he simply inflates his dress from this reservoir. For full information see F. A. P. Barnard's *Report on the Paris Exposition of 1867*.

Divining Rod (in Lat. *virgula divina*): a Y-shaped or forked branch of wood, usually cut from a tree; sometimes artificially made, or a metallic rod similarly shaped; by which, according to the belief of the vulgar, water or minerals hidden under ground may be discovered. The operator grasps a prong in each hand, holding the rod before him as he walks, and when the exact spot is reached the rod twists suddenly, pointing to it. The superstition is one of very great antiquity. In Europe the rod used for finding water is usually a branch of the rowan tree; in the U. S. it is generally cut from the witch-hazel, or from a fruit-tree.

Divinity: See Theology.

Divisibility: the capacity of being separated into parts. The question whether matter can be infinitely divided or not has often been discussed by philosophers. The subdivision of matter in nature is beyond calculation, nor can it be appreciated by the senses. A tube of glass has been drawn out by the blowpipe to the fineness of a silk fiber, still preserving the form of a tube. In the gilding of buttons five grains of gold, applied as an amalgam with mercury, are allowed to each gross, so that the coating left must amount to the 110,000th part of an inch in thickness. A single grain of blue vitriol will tinge 5 gal. of water. The divisibility of matter is best illustrated in the case of odors. The particles which impress the sense of smell must fill the whole atmosphere for hundreds of cubic feet, and yet a grain of musk may perfume a large apartment for years with scarcely a sensible loss of weight. See CHEMISTRY.

Division: one of the four fundamental operations of arithmetic, its object being to find out how many times one number is contained in another. The dividend is the number to be divided; the divisor, the number of parts into which it is to be divided, the value of one of these parts being the quotient; or the divisor may be one of these parts, and the quotient the number of them in the dividend. Division is an inverse process, whose effect is annulled by the direct operation of multiplication. It is necessary in dividing a number to have recourse to tentative processes, suggested by previous knowledge, and the accuracy of the procedure may be tested by multiplication.

DIVISION in logic is the enumeration of the species which make up a given genus; thus tree is divided into oak, elm, etc.

DIVISION in military language signifies—1, two or more brigades under a general officer; 2, two guns of a battery of artillery, with their equipment, etc.; 3, two companies of a battalion arranged in column of two companies.

DIVISION in music is the separation of the interval of an octave into a number of lesser intervals.

Division of Labor: in political economy, the plan by which a mechanic or laborer, instead of finishing the whole of any piece of work, is kept employed upon one special department of that work. Many persons are in some trades employed in turning out a piece of work which would formerly have been finished by one man. The first result of the division of labor is the great increase of production, for ten men, each employed upon a special branch of work, will turn out more and much better work than the same ten men would do if each began and finished an entire piece of mechanism. It is objected, on the other hand, that the division of labor tends to diminish the versatility and excellence of individual workmen, and the force of this objection is felt in times of industrial depression, when highly specialized labor can not readily flow into other channels. Division of labor is extending with the advance of civilization. Even the learned professions are influenced by it. Lawyers more and more devote themselves to particular departments of their professional work. Medicine is becoming divided into specialties. No one man is equally expert in every branch of a great science like chemistry, some giving their attention, for example, to organic chemistry, some to toxicology, others to analysis, etc. The general result will undoubtedly be beneficial to society.

Divorce [O. Fr. *divorce*: Ital. *divorzio* < Lat. *divor'tium*, separation, divorce, deriv. of *diver'tere*, separate, turn aside]: the dissolution of a marriage by a court of law, or, in some cases, by a legislative or parliamentary act. In heathen nations divorces have generally taken place at the will of the parties concerned, and even the ancient Romans, during the later period of the republic and under the emperors, allowed the greatest license in this respect. Divorce existed to some extent among the Greeks, more especially at Athens. Easy divorce, which had prevailed among the Hebrews, was restrained and discouraged, though not done away with, by the laws of Moses. Among Christian nations marriage is for the most part looked upon as possessing at once a religious and a civil importance. The Roman Catholic Church denies the possibility of divorce, although there are cases in which, according to the canon law, the union is declared to have been illegal from the first, and in reality never to have existed at all. In English law the word divorce has been applied to two distinct classes of cases—one where the marriage is by competent authority declared to be void from the beginning; the other, where it is conceded to have been valid in its origin, but for some cause subsequently arising it is dissolved or suspended. The first instance is sometimes termed a case of nullity—the second, a case of dissolution or of judicial separation. Sentences of nullity and of judicial separation, not amounting to dissolution, might take place in the ecclesiastical courts. A marriage could only be dissolved by act of Parliament. In the year 1857 an act was passed establishing the Court for Divorce and Matrimonial Causes, in which was vested the power previously exercised by the ecclesiastical courts as well as by Parliament. In the U. S., as there are no ecclesiastical courts in the English sense, matrimonial jurisdiction is established by statutes in the different States, enumerating the causes of divorce, which are by no means uniform. These, as a rule, are more numerous in the Western States than in the Eastern. The power to grant divorces is in general exercised by courts having equity jurisdiction, though it exists in the legislature, unless taken away by the State constitution. This is the case in a number of the States, and among them New York.

Revised by T. W. DWIGHT.

Dix, DOROTHEA LYNDE: philanthropist; b. at Worcester, Mass., about 1794; was a school-teacher in her youth, but about 1830 inherited from a relative a modest competence. She devoted much time to the work of ameliorating the condition and treatment of prisoners, lunatics, and paupers, for which purpose she visited nearly every State of the Union, efficiently promoting the establishment of asylums for lunatics in New York, Pennsylvania, North Carolina, Illinois, Indiana, and other States. By petitions to Congress she induced that body in 1854 to appropriate 10,000,000 acres of public land for the endowment of hospitals for the insane, but President Pierce vetoed the bill, chiefly on the ground that the general Government has no constitutional power to make such appropriations. During the civil war she rendered service in the hospitals near Washington. Besides children's books, tracts, etc., she published anonymously *The Garland of Flora* (1829) and *Prisons and Prison Discipline* (Boston, 1845). D. in Trenton, N. J., July 19, 1887.

Dix, JOHN ADAMS, LL. D.: statesman and general; b. at Boscawen, N. H., July 24, 1798. He entered the army in 1812, and became a captain in 1825, but soon resigned and studied law. He removed to Cooperstown, N. Y., joined the Democratic party, and was elected Secretary of State in 1833. After he had passed several years in private life, he was elected to the Senate of the U. S. in 1845, to fill a vacancy. He advocated in the Senate the principles of the Free-soil Democrats, whose candidate for Governor he was in 1848. He was chairman of the Senate committee on commerce. His term expired in Mar., 1849, and he was then succeeded by Mr. Seward. Having visited various countries of Europe, he published a *Summer in Spain and Florence* (1855). He was Secretary of the Treasury of the U. S. from Jan. to Mar., 1861, and as such issued the famous order: "If any one attempts to haul down the American flag, shoot him on the spot!" referring especially to the captain of a revenue cutter of New Orleans who had refused to obey orders. In May, 1861, he became a major-general of volunteers, and in July, 1862, took command of Fortress Monroe. He was appointed commander of an army-corps in Sept., 1862, and ascending York river in June, 1863, cut Gen. Lee's communications. He was minister to France in 1867–68, and chosen president of the Union Pacific R. R. In 1872 he was elected Governor of New York by the Republicans. D. in New York city Apr. 21, 1879.

Dix, MORGAN, S. T. D., D. C. L.: an Episcopalian divine, son of Gen. J. A. Dix; b. in New York city Nov. 1, 1827; graduated at Columbia College 1848, and at the General Theological Seminary 1852; became assistant minister in Philadelphia (St. Mark's) 1853; of Trinity church, New York city, 1855; assistant rector of Trinity 1859; rector 1862. He is also president of the standing committee of the diocese of New York, vice-president of the New York Protestant Episcopal public school, and holds various other offices. Among his works are *Commentaries on Romans* (New York, 1864) and on *Galatians and Colossians* (1866); *Lectures on Pantheism* (1865); *Lectures on the Two Estates, that of the Wedded in the Lord, and that of the Single for the Kingdom of Heaven's Sake* (1872); *The First Prayer-book of King Edward VI.* (1881; 4th ed. 1885); *The Calling of a Christian Woman and Her Training to Fulfill it* (1883; 6th ed. 1885); *Memoir of John A. Dix*, his father (2 vols., 1883); *Gospel and Philosophy* (1886); *The Sacramental System* (1893).

Dixon: town; on railway: Solano co., Cal. (for location of county, see map of California, ref. 7–C); 21 miles W. by S. of Sacramento. Pop. (1890) 1,082; (1900) 783.

Dixon: city and railway center: capital of Lee co., Ill. (for location of county, see map of Illinois, ref. 2–E); situated on Rock river; 98 miles W. of Chicago, and 40 miles E. of Clinton, Ia. Dixon has a normal school, business college, flouring-mills, milk-condensing factory, plow-factory, and three shoe-factories. Pop. (1880) 3,658; (1890) 5,161; (1900) 7,917. EDITOR OF "TELEGRAPH."

Dixon, JAMES, D. D.: Methodist minister; b. at King's Mills, Leicestershire, England, Oct. 28, 1788; became a preacher in 1812, and occupied important pulpits in his denomination; was the president of its conference in 1841, and its delegate to the American Methodist General Conference in 1848. He wrote, besides other works, *Methodism, its Origin, Economy, and Present Position* (London, 1843) and *Methodism in America* (1849). D. in Bradford, Yorkshire, Dec. 28, 1871. See his *Life* by his son R. W. Dixon (London, 1874).

Dixon, JAMES MAIN, M. A., F. R. S. E.: teacher; b. at Paisley, Scotland, Apr. 20, 1856; educated at Ayr Academy and at Edinburgh and St. Andrews Universities. He was Tyndall Bruce Scholar and Tutor in Philosophy, St. Andrews, 1879; Professor of English Literature in and secretary of the Imperial College of Engineering, Tokio, Japan, 1886–92, and became Professor of English Literature, Washington University, St. Louis, Mo., 1892. He has published a *Dictionary of Idiomatic English Phrases* (London, Edinburgh, and New York, 1890) and various papers in the *Transactions of the Asiatic Society of Japan*.

Dixon, WILLIAM HEPWORTH: author and critic; b. in Manchester, England, June 30, 1821, of Dissenting parents; settled in London in 1846, and contributed to the *Daily News*. His articles on *London Prisons*, in book form, in 1850, were the precursors of Mayhew's inquiries into the condition of the London poor. In 1849 he published a *Life of John Howard*, which passed through three editions in one year. In *William Penn, an Historical Biography* (1851), he replied to the animadversions of Macaulay on the character of the philanthropical Quaker. He was the chief editor of the *Athenæum* from 1853 till 1869. Among his other works are a *Personal History of Lord Bacon* (1861); *The Holy Land* (1865); *New America* (1867); *Spiritual Wives* (1868); *Her Majesty's Tower* (4 vols., 1869–71); *Free Russia* (2 vols., 1870); *British Cyprus* (1879); *Royal Windsor* (1878–80). D. in London, Dec. 27, 1879.

Dixon's Entrance: a strait on the west coast of North America, 100 miles long. It separates Queen Charlotte island from the Prince of Wales archipelago.

Djemil Pasha, jem-eel'pa-shaa', or **Jemeel Pasha**: Turkish statesman; b. at Constantinople in 1827; the eldest son of Resheed Pasha. He was educated at Paris and London, and was for many years a public officer, especially in diplomatic affairs. In 1866 he was appointed ambassador to Paris. D. Sept. 22, 1872.

Djezzar, or **Jezzar** (the butcher): surname of ACHMED PASHA; Turkish soldier and governor; b. in Bosnia, 1735; left his country to escape punishment for a crime, and after many hardships was sold as a slave at Cairo to Ali Bey, in whose service his success as an assassin of his master's enemies won for him the title of butcher. But his reluctance in one instance to commit murder cost him Ali's favor, and he soon had to flee the country. He then sought service in Syria, where his boldness and duplicity exalted him above his rivals and brought him to the favorable notice of the Sultan, who made him Pasha of Acre with the mission of crushing out the independence of the Druses, a work that he executed with savage effectiveness. His violence to the French consul and residents at Acre was one of the ostensible grounds for Napoleon's invasion of Syria in 1799. Though alarmed by the victories of the French, Djezzar was induced by Sir Sidney Smith to attempt the defense of Acre. The result was a serious check to the French arms. A three months' siege, in the course of which several assaults were made, proved unavailing; a pestilence broke out among the besiegers, and the threatened attack of the English on Egypt caused their recall. D. at Acre, 1804.

F. M. COLBY.

Djinn: See JINN.

Dmitrof, d'mĕĕ-trŏf': town of Russia; government of Moscow; 40 miles N. of Moscow (see map of Russia, ref. 7–E). It has seven churches, a college, and manufactures of cotton and silk goods. Pop. 9,206.

Dnieper, nee'per [the *Borysthenes* of the Greeks, the *Danapris* of the Romans, the *Uzi* of the Turks, the *Elice* of Visconti's map (1381), the *Lerene* of Contarini (1437)]: a river of Russia, and, next to the Volga and the Danube, the greatest and most important river of Europe; rises in the government of Smolensk, at the foot of the Valdai Hills, near the sources of the Volga and the Dwina, in lat. 55° 52′ N. It flows nearly southward to Kief, below which its direction is southeastward to Ekaterinoslaf. It afterward runs southwestward, and enters the Black Sea on the north side. Its length, including windings, is about 1,330 miles. The greater part of it is navigable, but some rocky rapids occur below Ekaterinoslaf, where the river has to make its way through the granitic offshoots of the Carpathian Mountains. At Kief the river is free of ice 267 days in the year; at Ekaterinoslaf, 274; and at Kherson, 280. The fisheries are insignificant in the upper part of the river, but very important in the estuary. From the mouth of the Berezina the Dnieper will be the southern part of the ship-canal route building (1899) from Riga on the Baltic to the Black Sea. (See SHIP-CANALS.) Its principal tributaries are the Berezina, the Pripet, the Merea, the Sozh, the Borona, and the Desna, all of which are navigable.

Dniester, nees'ter (anc. *Tyras*, afterward *Danaster*): a river of Europe; rises in the Carpathian Mountains in Galicia, and flows southeastward into Russia. It forms the boundary between Bessarabia on the right and Podolia and Kherson on the left, and enters the Black Sea near Akerman, about 30 miles S. of Odessa. Its total length is about 760 miles. Its navigation is difficult; besides frequent shallows, the Yampols rapids, caused by a granitic spur of the Carpathian Mountains, obstruct the course. For ordinary river-craft the passage of these rapids has been made possible, though not free from danger, by an artificial channel.

Doab, or **Duab**, doo-aab' (i. e. two waters): in Hindustan, a tract between two rivers, especially that between the Ganges and the Jumna. This doab extends from Allahabad to the base of the Himalayas, a distance of 500 miles or more.

Doane, GEORGE WASHINGTON, D. D., LL. D.: bishop and poet; b. at Trenton, N. J., May 27, 1799; graduated at Union College in 1818; ordained as an Episcopalian clergyman in 1821; preached in New York city, and chosen Bishop of New Jersey in 1832. He published a volume of poems (1824) and several works on theology. D. in Burlington, N. J., Apr. 27, 1859. See his *Life and Writings* (4 vols., New York, 1860).—One of his sons, WILLIAM CROSWELL DOANE, D. D., LL. D. (b. in Boston, Mass., Mar. 2, 1832), also an Episcopalian clergyman, was on Feb. 2, 1869, consecrated Bishop of Albany.—A second son, GEORGE HOBART DOANE (b. in Boston, Mass., Sept. 5, 1830), became a Roman Catholic priest; was in 1873 appointed vicar-general of the diocese of Newark, and in 1886 received the title of monsignor.

Doane, THOMAS: See the Appendix.

Dobbin, JAMES COCHRANE: politician; b. at Fayetteville, N. C., in 1814; graduated at the University of North Carolina 1832; admitted to the bar 1835; became a member of Congress in 1845, and was appointed Secretary of the Navy by President Pierce in 1853. D. Aug. 4, 1857.

Dobbs Ferry: village; Westchester co., N. Y. (for location of county, see map of New York, ref. 8–J); on railway and on Hudson river; 20 miles N. of New York city. It has manufactories of gas-burners and piano-stools, and is a place of summer residence. Here are remains of military works erected during the Revolutionary war. Pop. (1890) 2,083; (1900) 2,888.

Dobell', SYDNEY: poet; b. at Cranbrook, Kent, England, Apr. 25, 1824; a wine-merchant's son. He began his literary career by *The Roman*, a poem (1850). Among his other works are *Balder* (1854); *England in Time of War* (1856); and *England's Day* (1871). His poems exhibit a mixture of the philosophical and poetical spirit. D. Aug. 22, 1874. See his *Life and Letters* (2 vols., 1878).

Döbereiner, JOHANN WOLFGANG: chemist; b. near Hof, Bavaria, Dec. 15, 1780; studied at Jena, where he became in 1810 Professor of Pharmacy and Chemistry, a position which he held until his death. He was an intimate friend of Goethe, by whom he was aided in his investigations. He is best known as the discoverer of the combustibility of platinum and of the so-called Döbereiner's lamp, which is

ignited by directing a jet of hydrogen upon a piece of platinum sponge. D. at Jena, Mar. 24, 1849. Among his writings are *Zur Gärungschemie* (1822); *Beiträge zur physikalischen Chemie* (1824–36); and *Zur Chemie des Platins* (1836).

Dobrizhoffer, Martin: Jesuit missionary; b. at Gratz, Styria, Sept. 7, 1717. He entered the Jesuit Society in 1736, and in 1749 was sent as a missionary to Paraguay, where he remained until the expulsion of the Jesuits from South America in 1767. At first he taught in the long-established Guarany missions; later he was sent to the western side of the Paraguay, where for seven years he labored among the savage Abipones Indians. Returning to Europe in 1767 he lived in Vienna, Austria; the Empress Maria Theresa often sent for him that she might hear him recount his adventures. In 1784 he published in Latin an account of Paraguay, and especially of the Abipones, with the title, *Historia de Abiponibus, Equestri, Bellicosaque, Paraquariæ Natione*, etc. This was republished the same year in German, and there is an English translation, by Sara Coleridge, entitled *An Account of the Abipones* (3 vols. 8vo, London, 1822). This is one of the most interesting books of travel ever published, and gives by far the best account of a tribe which is now extinct. D. in Vienna, July 17, 1791.

Herbert H. Smith.

Dobrowski, dō-brov'skeĕ, Joseph: philologist; b. near Raab, Hungary, Aug. 17, 1753. He was liberally educated, joined the Jesuits, and distinguished himself by his researches into the language and literature of the Slavonic nations. His most important works are a *Grammar of the Bohemian Language*; a *History of the Bohemian Language and Literature* (1792); and a *German and Bohemian Dictionary* (2 vols., 1802–21). He also published a number of minor essays. D. at Brunn, Jan. 6, 1829.

Dobrudscha, or **Dobrujda**, dō-broo'jăă: the southeastern portion of Roumania; separated from Moldavia and Wallachia by the Danube, and bounded E. by the Black Sea. It belonged to the Turks until 1878. Pop. about 175,000, consists of Bulgarians, Cossacks, Tartars, Armenians, Turcomans, Greeks, and Jews.

Dobson, Henry Austin: poet; b. in Plymouth, England, Jan. 18, 1840. He was educated as a civil engineer, but since 1856 has held a clerkship in the Board of Trade. He has successfully domesticated old French stanza forms in English verse, and is unexcelled as a writer of *vers de société*. Author of *Vignettes in Rhyme* (1873); *Proverbs in Porcelain* (1877); *At the Sign of the Lyre* (1885). Mr. Dobson has also done much to revive a taste for the English art and literature of the eighteenth century by studies of *Hogarth* (1879); *Thomas Bewick* (1884); *Sir Richard Steele* (1886); *Oliver Goldsmith* (1887), etc. H. A. Beers.

Doce, dō'sā: a river of Southeastern Brazil; rising in the Serra da Mantiqueira of Minas Geraes, and flowing with a general easterly course, through Espirito Santo, to the Atlantic; length from the junction of the rivulets Piranga and Gualacho, which are regarded as the sources, 462 miles. It is navigable for small steamers to Sousa, 138 miles. The basin of the Doce embraces over 20,000 sq. miles, largely of forest land, much of which is very fertile, but has not yet been utilized. The Doce valley has long been a principal source of the rosewood supply of Brazil. The upper river flows through a wild mountain region. See Hartt, *Geology and Physical Geography of Brazil*, 1870, p. 86, *et seq.*

Herbert H. Smith.

Doce'tæ [Gr. Δοκηταί, deriv. of δοκεῖν, hold opinion]: a sect which arose in the first century, practically denying the incarnation of God in Christ. Some of the Docetæ affirmed the body of Christ to be a mere deceptive appearance, others only denied its fleshly character, but the object of both was to render the conceptions of Christ's life on earth less gross and material than the orthodox view seemed to them to present. Docetism was one of the earlier forms of Gnosticism (*q. v.*).

Dock: a perennial herbaceous plant of the family *Polygonaceæ* and genus *Rumex*, found chiefly in temperate climates; has large ovate or lanceolate leaves, and greenish flowers in panicles. It increases rapidly from the seed, and having long tap-roots is a very troublesome weed. The roots of several species are valued in medicine for their astringent properties; they are also used in dyeing. The yellow dock (*Rumex crispus*) is esteemed in the U. S. as an alterative.

Docket [apparently deriv. of verb *dock*, cut short, as an abridgment, summary]: a summary or abridged entry of a proceeding on a piece of paper or parchment. Exemplifications of decrees in chancery, fiats in bankruptcy, and other instruments are thus *docketed* for purposes of reference. The word docket is frequently employed to designate an abridged entry in a book, as in the case of judgments of courts, in order to make them a lien upon land, and also a book of records. Docket also denotes a list or calendar of causes ready for hearing or trial, prepared for the use of courts.

Revised by F. Sturges Allen.

Docks: artificial basins for the reception of ships. *A wet dock* is a large basin in which the water is kept at a certain level by means of walls, so as to be unaffected by tidal changes, in order to facilitate the loading and unloading of cargoes. *A dry dock* is intended for the repairing and examination of ships, the water, after the entrance of the vessel, being removed by pumps or other means.

In ports where vessels would be naturally much exposed during rough weather, or where the changes in the tide are very great, the necessity of secure and well-sheltered docks or artificial basins, in which ships may be safely moored and kept at one level, is especially manifest. In the northern parts of Europe the rise and fall of the tides are so great that every port which has any pretensions to a first-class mercantile harbor is necessarily supplied with one or more wet docks; at most of the ports of Great Britain, and especially at those of Liverpool and London, docks have been constructed on a truly magnificent scale.

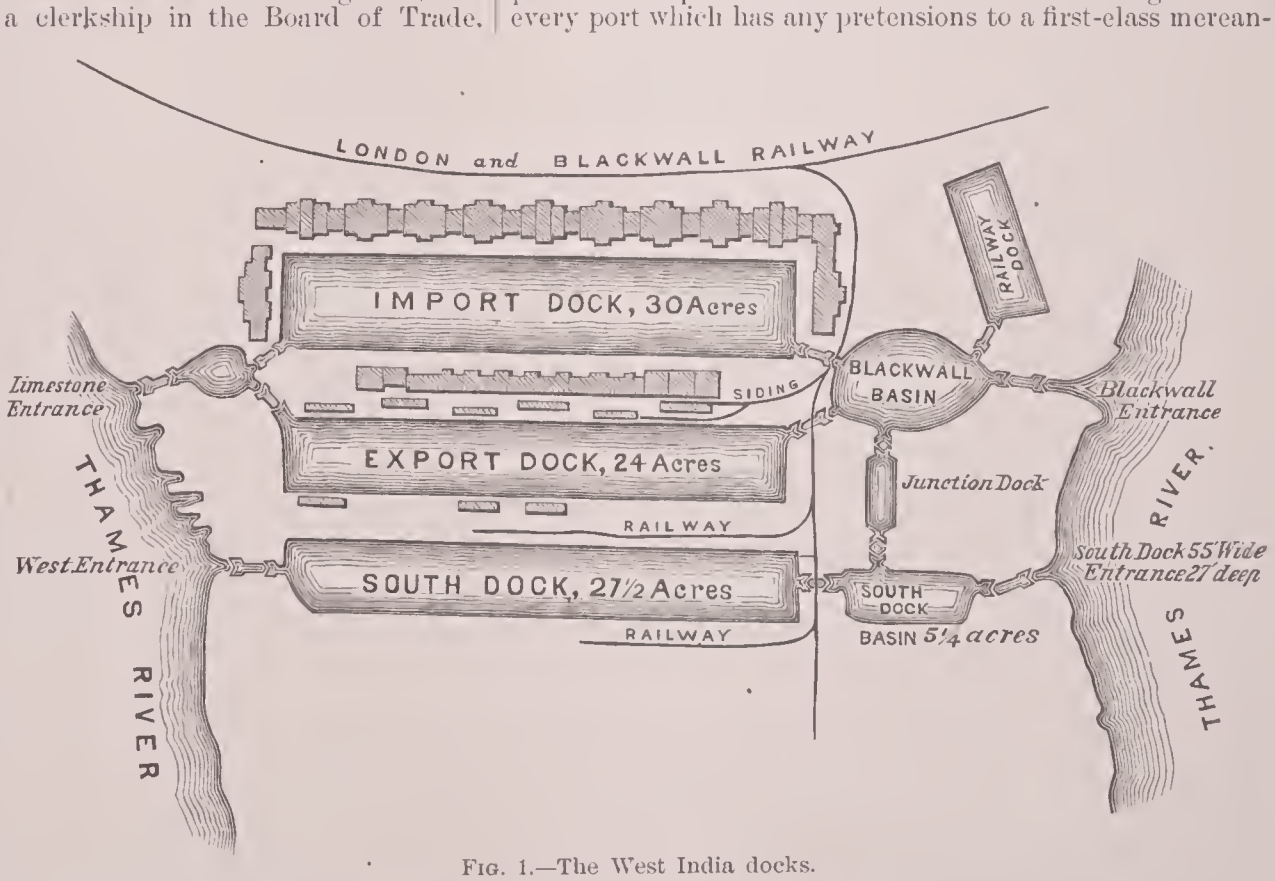


Fig. 1.—The West India docks.

Notwithstanding the obvious importance of wet docks to the vast trade of London, it was not until a few years previous to the beginning of the nineteenth century that plans for docks on anything like an adequate scale were, at the request of a parliamentary committee, submitted by Messrs. Telford and Douglas, among other plans for the improve-

ment of the port of London. The act authorizing the construction of the West India Docks was passed in 1799; work was begun in Feb., 1800, and in 1802 they were so far completed that a homeward-bound vessel entered them.

These, the first docks of London, with their entrances and basins, extend across the isthmus (at low water) of the island formed by the Thames on the Middlesex side of the river, and called the Isle of Dogs. They originally consisted of an Import Dock containing an area of 30 acres, and an Export Dock with an area of 24 acres, connecting at both ends by basins and locks with the Thames. They were constructed of brickwork and timber. There was a canal on the south side of the docks, which was subsequently converted into a dock called the South Dock, the retaining walls of which are 34 ft. 10½ in. in height from the bottom of the dock to the top of the coping, where the width is 11½ feet, spreading downward with a batter of 1 in 24: the face and back of the wall are of brick, the former 3 ft. 4½ in., the latter 18 inches thick, connected by vertical transverse walls 2 ft. 3 in. in thickness, and placed 10 feet apart, the pockets thus formed being filled with concrete, upon a foundation of which, 3¼ feet in thickness, the wall stands. The bottom of the dock is covered throughout with a layer of puddle 18 inches in thickness. On the north side are sixteen jetties, projecting into the dock, of timber, 130 feet in length, furnishing accommodations for thirty-two vessels, and opposite each jetty is a buoy for mooring vessels. The area of the South Dock is 27½ acres.

The cost of the South Dock, with the machinery, railway extension, dock-basins, warehouses, etc., was $2,850,000. It will be seen from the plan that an incoming vessel can pass directly into the Import Dock, unload her cargo, and then, without being locked out into the Thames, when the tide permits may pass into the Export Dock to receive her outward-bound cargo.

The East India Docks, which are a short distance to the eastward of the West India, were at first intended exclusively for ships in the East India trade, but are now open to vessels from all parts. Their area is 27 acres, exclusive of entrance-basins, and their depth of water is never less than 23 feet. They belong now to the same company as the West India Docks, and have magnificent warehouses for tea, indigo, drugs, spices, etc., attached to them.

The London, the St. Katherine, and the Victoria London Docks, also on the north side of the Thames, are under the control of one company. The London Docks have a water-area of 34 acres, the St. Katherine Docks a water-area of 11 acres, and the Victoria London Docks, situated immediately below the East India Docks, have an area of 74 acres in the inner dock alone, exclusive of 16 acres in the tidal basin. The depth of water in the inner dock varies from 24½ feet to 26½ feet. The entrance to this dock from the Thames is by means of a lock 320 feet in length, 80 feet in width, and with a depth of water on the sill of 28 feet. The jetties, with the sides of the dock and of the basin, provide a length available for quay-room of nearly 3 miles.

On the Isle of Dogs, S. of the West India Docks, are the Millwall Docks, comprising two basins, one having a water-area of 25 acres, the other of 10½ acres. The Surrey Commercial Docks, intended for ships with bulky commodities, are upon the south side of the Thames, and have a water-area of 176 acres.

These various docks have undergone extensions and improvements, to keep pace with the requirements of commerce, the latest addition being the Albert extension of the Victoria Dock, opened in 1880, and affording an additional water-area of 70 acres. It is one of the most complete docks in the world. The Tilbury Docks opened in 1885 provide 76 acres. The total water-area of the north side docks exceeds 465 acres, and the Surrey and Commercial docks, on the south side, cover 330 acres, giving an aggregate of over 795 acres. Including the land contiguous to the quays there are over 2,000 acres devoted to terminals.

The docks are also provided with cranes and other appliances, worked by steam or hydraulic power, for the rapid transfer of cargoes.

The dock establishments of Liverpool are not excelled in extent and arrangement by those of any port throughout the world. Though the number of vessels belonging to this port is less than that of London, yet the fact that they can not lie with safety or ease in the Mersey on account of its rapid current and exposed situation, and the great rise and fall of the tides (21 feet at neap and 31 feet at spring tides), require the dock accommodations to be of sufficient extent for the entire trade of the port: while at London the Thames affords a secure and convenient berth for a great number of vessels.

The Liverpool docks have, on the side next the river, a sea-wall of 6¼ miles in extent, which, when considered in connection with the obstacles to be overcome, is one of the greatest works of modern times. In most cases docks are formed by excavations made on the bank of the river, but at Liverpool they have been formed in the river itself by inclosing within the wall referred to a portion of the beach of the Mersey, and afterward excavating the part thus reclaimed to a proper depth. The wall is 11 feet in thickness and 40 feet in height from the foundation, the more modern parts being faced with granite. There are between thirty and forty docks, having a water-area of 363½ acres, exclusive of 19 acres of entrance-basins. The quay-space is over 24 miles. Most of the docks have a separate entrance from the Mersey, and communicate with each other, so that ships may pass from one to another without the necessity of being locked out into the river and back again into the docks. They are also connected with the different railways entering the town, and by a series of locks with the Leeds and Liverpool Canal.

The new North Docks are estimated to cost $20,500,000. They will include the Langton Dock, of 18 acres; the Alexandra Dock, of 44 acres; and the Hornby Dock, of 17 acres.

Large steamers of an aggregate tonnage of 34,197 have been docked and cleared in one tide of 2⅔ hours.

The whole of this immense dock estate is vested in the Mersey Docks and Harbor Board, who enforce strict rules for the maintenance of good order and prevention of fire and depredation. Every precaution is taken to prevent the injury of the docks from the accumulation of mud by the use of steam-dredging machines. The income of the Mersey Docks and Harbor Board for 1889 was $4,950,000 on 9,292,000 tons. The revenue of this board, after paying expenses and interest on money borrowed, is applied to the reduction of the dock rates.

The landing-stage is 2,063 feet long and from 80 to 110 wide, covering 4 acres. It is supported on 158 boiler-plate pontoons, 80 by 10 by 7 feet, and cost $2,350,000. Seven hinged bridges and one floating roadway lead to it. The traffic amounts to about 2,500,000 passengers per year.

There are 25 graving-docks, with a total floor length of 12,490 square feet, costing $4,700,000.

The warehouses are very extensive, covering 93 acres, with sheds sheltering 94 acres more, while their cost has been $16,660,000.

Birkenhead, on the Mersey, directly opposite to Liverpool, has a water-area of 165 acres of docks and subsidiary basins; among them are two large docks, one of 52, the other of 59 acres. The quay-space is betweeen 10 and 11 miles in length. At Southampton there are docks surrounded by quays and bonded warehouses, and provided with powerful shears for shifting boilers, heavy machinery, masts, etc. Among other ports of the British islands which possess large docks may be named Bristol, Hull, Grimsby, Barrow-in-Furness, Sunderland, Glasgow, Leith, Newcastle-on-Tyne, Tyne, Cardiff, and Belfast.

At Havre, where the rise of the tides is from 20 to 27 feet, there are capacious docks. At Antwerp, where in 1803 Napoleon I., who intended to make it a great naval establishment, undertook the construction of docks on a grand scale, new and convenient ones with warehouses have been opened. At Bremen and Amsterdam docks have been constructed and improved.

The port of Cardiff is celebrated for its large docks. It is located on the river Taff, a short distance from the Bristol Channel, where the spring tides rise 37½ feet and the neap 29; consequently the flats, which are bare at low water, may be readily traversed at high tides. The town is of recent origin. In 1839 the West Bute Dock was built, covering 20 acres, at a cost of about $100,000 an acre. The opening of the Taff Vale Railway in 1841 so stimulated commerce that in 1851 the East Dock was commenced and opened in 1855, although not finished until 1859. It covers 46 acres, but was soon found to be too small, and the Roath Basin was opened in 1874, covering 12 acres. Another large dock connecting with this basin will extend the total area to about 113 acres. The West Dock is only 200 feet wide, while the East Dock is from 300 to 500 feet in width, the Roath Basin 550, and the New Basin 600 feet.

These basins are supplied with fresh water from the Taff. The quays are fully supplied with coal tips or staiths, 13

balance tips at the West Dock, 12 balance and 8 hydraulic tips at the East, 8 at the Roath Basin, and one at the entrance-channel. One movable hydraulic 25-ton crane is also used, and over 12,000,000 tons of coal can be shipped here each year. The gates, bridges, and machinery are all operated by hydraulic power. There are also 8 graving-docks, varying in length from 220 to 600 feet. The tonnage has increased so rapidly as to give rise to rival docks at Penarth and Barry, which are also growing rapidly, being thoroughly equipped with the best modern appliances.

In many ports throughout the world—such, for example, as that of New York, where the harbor is naturally protected, and as also in the Mediterranean, where the rise and fall of the tides is so small as not to obstruct the loading and unloading of ships—wet docks are not an absolute necessity to commerce.

But, though in many cases they may be dispensed with, all first-class ports need dry docks for the examination and repair of those parts of a ship which are usually immersed in water. Dry docks may be separated into two classes—the *stationary dry dock*, to which the name *graving-dock* is generally applied, and *the floating dock*.

In ancient times, where there was no rise and fall of the tides, vessels were hauled up on the beach and "careened"; where the tides permitted they were grounded at high water, so as to be exposed at low. Sometimes the heaving-down plan was adopted; this was to attach ropes to the heads of the masts of the vessel and to the mooring rings of a quay, or to the deck of another vessel, so as to haul the ship over into a nearly horizontal position on the water, the ballast or weights being removed or shifted. It was while undergoing this very dangerous operation that the Royal George foundered at Spithead in 1782, with 600 persons on board.

This method was supplanted by the *graving-dock*, generally constructed of stone, though sometimes of timber, and usually of such dimensions as to contain only one vessel at a time. The sides are formed in steps or altars, so that the form of the dock is somewhat similar to that of the vessel which it is to contain, but sufficient space is left around it to enable the workmen to get at every part of the bottom of the vessel and to afford sufficient light for their work. The entrance is closed by gates, which open sideways, like a lock, or fall upon the bed of the entrance, or by caissons; the latter, since the introduction of iron for ship-building purposes admits of their being made of that material, are almost universally adopted for large docks, and have the advantage of affording the means of retaining the water inside the dock as well as of keeping it out, which is of importance where the tide is ebbing rapidly, in allowing time to adjust the vessel before it settles down on the keel-blocks. The vessel is floated into the dock at high water, the gates closed, the sluices opened, and the water allowed to run out with the ebb of the tide, or, where the fall of the tide will not permit, is pumped out, leaving the dock perfectly dry, the vessel being supported on timber struts and shores resting upon the steps already mentioned as forming the sides of the dock.

The U. S. naval graving-dock at Brooklyn, N. Y., was, in its day, one of the finest in the world. At the time of its construction it possessed many features and improvements that were unequaled by any other graving-dock. Owing to the nature of the soil selected for its site, the excavation for the foundation was attended with many obstacles, and afforded opportunity for the display of great engineering skill. This lower soil was an almost impalpable quicksand, becoming semi-fluid when saturated with water; and before the required level for the foundation had been reached springs coming from a great depth burst up through it, rendering necessary measures to overcome it. This was finally done by driving piles into the cavities formed by the springs, on which a flooring of plank was laid; upon this bricks were laid in hydraulic cement, and upon the brick floor concrete masonry, the whole being done with the greatest dispatch; vent-holes for the water were left until the permanent foundations were completed. In this manner the flow of sand was checked.

The gates, of iron, are supported on friction rollers, and, with the machinery for turning them, weigh nearly 200 tons. The caisson is an iron vessel, with keel and stems made to fit the grooves in the masonry at the entrance of the dock. It is 50 feet in length at the keel, and 68 ft. 8 in. in length at the rail; its breadth at the center of the top is 16 feet, at the keel 7 feet. The grooves in the masonry, in which the stems and keel of the caisson fit, are 26 inches in width and 12 inches in depth from the top to the bottom of the side walls and in the floor. By admitting water into the chambers of the caisson it settles into these grooves and closes the entrance; it is removed by pumping out sufficient water to float it clear of the grooves. Its weight is nearly 218 tons, exclusive of ballast. It is used when greater length of dock may be required, when the turning-gates need repair, or to partially relieve the strain upon them. The engine and pumps are of very large capacity, and will

FIG. 2.—Plan of dry dock at Brooklyn navy-yard.

relieve the dock of water in about two hours. In order that the bottom may be dry and free from water, there is a slight inclination in the bottom of the dock, and a gutter is carried across at the lower end, leading into a culvert which passes entirely around the dock, from which the water is constantly pumped. Several flights of steps are provided in the different parts of the dock for the use of the workmen, by which they are enabled to reach any part of the vessel with great facility. The main chamber of the dock is 286 feet in length and 30 feet in breadth at the bottom,

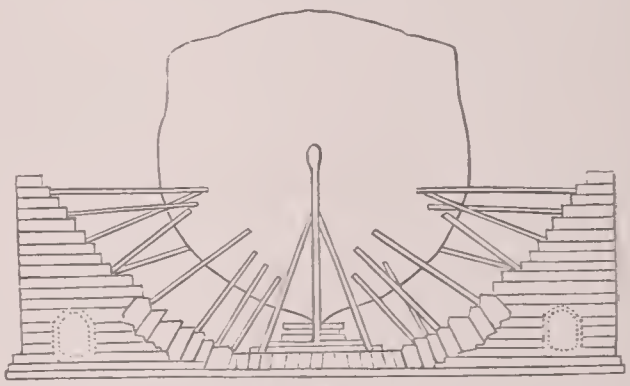


FIG. 3.—Section of dry dock at Brooklyn navy-yard.

307 feet in length and 98 feet in breadth at the top; by using the caisson an additional length of 52 feet may be obtained, giving a total length of 359 feet. The height of the walls is 36 feet, and the sills are 26 feet below high water. The total cost, including all machinery and appurtenances, was about $2,000,000; the work was completed in 1851.

The naval graving-dock at Boston, Mass., built of granite and completed in 1833, is 253 feet in length and 86 feet in width inside the chamber; the turning-gates and the caisson are of timber and composition fastened with copper bolts, the caisson being 60 feet in length, 30 feet in height, and 16 feet in width amidships. The total cost of this dock was about $700,000. The naval graving-dock at Norfolk, Va., is almost precisely similar in style and dimensions to that at Boston, and cost about $950,000.

The masonry dock at Mare island, Cal., has now (1893) been under construction about twelve years, and has cost nearly $3,000,000.

The cost of the construction of graving-docks depends greatly upon the situation selected. At Birkenhead five graving-docks, having an aggregate length of 1,690 feet, were hewn out of the rock at a cost of $430,000. Many of the most successful docks on the Thames have been built of timber and brick at a cost which is trifling by comparison. A heavy item of expense in those places where the fall of the tide is not sufficient to empty the dock is the cost of the large engines and pumps needed to remove the water.

In addition to her magnificent wet docks, Liverpool possesses a large number of graving-docks, there being on the side of the Mersey on which that city is situated no less than sixteen, having an aggregate length of over 1½ miles.

Among the largest graving-docks are the double dock at Brest, 721 feet in length, 92 feet in width, with a depth of 25 feet of water over the sill; and the double dock at Portsmouth, England, 644 feet in length by 80 feet in breadth. Portsmouth has besides nine single graving-docks, the

largest of which is 406 feet in length at the bottom. Devonport has five. Cherbourg eight, Sheerness five, Toulon six, Brest four. There are several on the Thames, and many other ports have one or more. Southampton has three, one of which, the Eastern Dock, is 425 feet in length, with a width of entrance of 80 feet, made, in 1853, of brickwork with Portland copings, and is stated to have cost $260,000.

The largest dry dock on the Great Lakes of North America is located at Detroit, Mich. It was built by the Detroit Dry Dock Company in 1891. The caisson gate is of steel, 79 ft. 5 in. long and 12 feet beam. It contains five 30-inch valves for flooding the dock, which it is estimated will require twenty minutes. The time required to empty the dock is an hour and a half. There are two centrifugal pumps having 30-inch discharge-pipes, operated by two 150 H.-P. Westinghouse engines. The fuel for the three boilers is oil. The dock is founded upon 2,000 piles driven into a fine blue clay and surrounded by a wall of puddle 5 feet thick. The cost was $200,000.

The Simpson dry dock is built of timber. Its inventors claim for it greater economy, freedom from water, facility of access for workmen, and better light and air, due to the great breadth at the coping. The altars have about the size and pitch of an ordinary staircase. The increased area of base due to the splay of the sides is compensated for by the use of timber in construction, and its durability and economy have proven to be so satisfactory that not less than fourteen of them have been constructed on the Atlantic coast. The one at St. Johns, Newfoundland, was built between May 28, 1883, and Dec. 10, 1884. The cost of the two docks at Brooklyn with one set of pumps was $1,283,356, and that for the one at the League island navy-yard, built in 1889–90, was $548,700. This structure is 500 feet in length; 130 in width at top; 50 at bottom; 80 at entrance; 25½ feet depth on the sill, and 32 feet to floor. The dock at Newport News is 600 by 130 feet at top, the dimensions and draught being almost exactly the same as those at St. Johns. It can be emptied in an hour and a half.

A prominent feature of these docks is the gate, which is made of iron or steel plates fastened to a trapezoidal frame, which rests in a groove in the abutment. On the outer edge of the groove there is a heavy semi-cylindrical strip or bead of rubber, which serves to make a watertight joint against the outside. In consequence of the great spread of the abutments, it is only necessary to raise the gate a few inches before it may be floated aside. Its weight at League island, Philadelphia, is about 120 tons. It is 88 feet long on top, 54 on the bottom, 32½ feet high, and has a beam width of 20 feet.

The new dry dock for the U. S. naval station on Puget Sound is to be a modification of the Simpson wooden dock, whereby greater attention is given to the drainage under the floor, which is to be constructed in part of concrete filling between piles, with drain pipes leading to open conduits. It will be larger than any hitherto built in the U. S. The soil is sand, gravel, and clay, with some hard-pan.

The last Brooklyn dock was opened in May, 1890. Its general dimensions are 530 feet long; inside of caisson, 500 feet; 130 ft. 4 in. wide at center on top, and 50 feet at bottom. The entrance is 85 feet wide at top, and 53 at floor. The sill is 30½ feet below coping, and 25½ below mean high water. Depth of floor, 32⅔ feet. The total cost was $595,892, while the adjoining masonry docks, only 359 feet long, cost $2,241,000.

The largest dry dock now building on the Southern coast is at Port Royal, S. C. It will be 500 feet long and about 120 feet wide. In its general features it will resemble that at Brooklyn, N. Y.

Of the floating dock there are several distinct varieties:

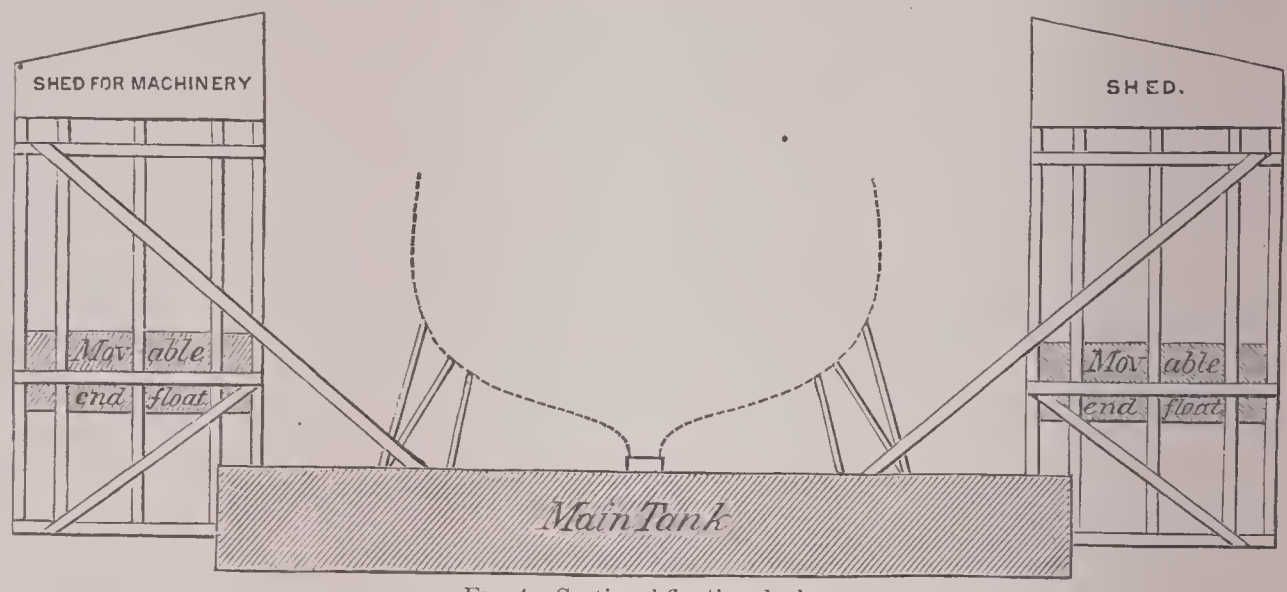


FIG. 4.—Sectional floating dock.

the sectional dock, such as is in use in the Philadelphia and San Francisco navy-yards; *the Gilbert balance dock*, in use in the Portsmouth, Va., and Pensacola, Fla., navy-yards; *the iron floating dock* of the Bermuda dock patern; *G. B. Rennie's patent iron floating dock*, of which the Cartagena dock is an example; and *Edwin Clark's hydraulic lift dock*, in use in the Victoria Docks, London.

The sectional floating dock in the Philadelphia navy-yard is made in nine separate and independent sections, differing only in their widths. Each section consists of a pontoon or tank, watertight, 105 feet in length, 30 or 32 feet in width, and 11 feet in depth; two end-frames, and two end-floats. Together, the sections form a floor of over 300 feet in length and 10[illegible] feet in width. At each end of each section is an open frame in which is a float, connected with the four posts of the framework, which is raised and lowered by machinery—raised to assist in sinking the main tank to the depth required, or lowered into the water to give it greater buoyancy.

When the dock is to be used a sufficient number of these sections are joined together to give the length required, and firmly connected by beams so arranged that they may be placed from 6 inches to 6 feet apart, though they are not generally farther apart than 3 feet. They are then connected by means of shafting with the engines, of which there are four. At each end of each section are three pumps. When the vessel is ready to be docked the main tanks or pontoons are filled with water, the end-floats raised by machinery upon the end-frames until the dock is sunk to the proper depth. The ship is then hauled over the dock, and the end-floats depressed into the water until its keel has a bearing upon the keel-blocks; the shores or supports for the vessel are then adjusted, and the water is

DIMENSIONS OF RECENT DRY DOCKS IN NORTH AMERICA.

Naval station, Puget Sound, Washington, U. S. A.		New timber dock to be built at Brooklyn.		Detroit, Mich.		Simpson's, at St. Johns, Newfoundland.	
Length on coping: head to outer end of table	625′ 3″	To inner abutment	560	Length	378½	Length	600
" " " " " gate	605 9	To inner gate	580	.....	.....	On heel	558
" " floor: head to inner abutment	529 3	To outer end, table	625	.....	.....	Width, head	78½
Width on coping: at body	130 1½	At body	151	Width	91	" body	132½
" " " at abutment	92 7½	At head	94	At opening	78	" abutment	84½
" " floor: in body	67 1½	At abutment	105	On sill	54	" bottom abutment	52¼
Depth, coping to mean high water	7 0	On floor at head	27	On floor	55	Depth over sill	25
" " " floor in body	39 3	" " in body	64				
		" " at end of table	116				
Draught over sill at mean high water	30 0	Depth, coping to floor	35	Depth to floor	20½		
		Draught over sill	28	Draught on sill	16½		

pumped from the tanks, the end-floats being used, if necessary, to preserve the proper equilibrium.

This dock, as well as Gilbert's balance dock, is used in connection with a basin and railways. The basin in the Philadelphia navy-yard is 350 feet in length by 226 feet in width. The floor, of granite 10 inches in thickness, is laid upon a pile and concrete foundation, and is perfectly level; on three sides of this floor are granite walls 14½ feet in height. The "bed-ways" are two, and each consists of three "ways"—one to support the keel, and two to support the bilges; each is 350 feet in length and 26 feet in width. The basin and "ways" are used thus: the dock, with the ship upon it, drawing from 8 to 10 feet of water, is hauled into the basin by means of capstans; the line of the ship's keel is brought into the line of the "bed-ways," water is admitted to the tanks, and the dock settled firmly upon the stone platform of the basin. The vessel, by means of hydraulic power and a cradle, is slid upon the bed-ways, and the dock may be immediately used for another vessel. The dock without the basin may be used for repairing a vessel. This dock was completed in 1851 at a total cost of about $814,000. Its lifting power is nearly 6,000 tons.

The California sectional dock is composed of ten sections, 100 feet in length, 32 feet in breadth, and 11 ft. 9 in. in depth.

The balance floating dock was invented by Mr. John S. Gilbert, of New York city. Like the sectional dock, it is constructed of timber, and consists of a pontoon bottom with two side walls, possessing sufficient displacement to carry the whole weight of the dock and the vessel to be raised. The side walls are hollow and of considerable width, serving, like the floats in the sectional dock, to preserve its stability in rising and sinking. The outside of these walls is vertical, while the inside is sloping, so as to conform to a certain extent to the shape of the ship. Port-holes are made in the walls for ventilation. The walls also afford the means of shoring up the ship, as in a stone dock; on the top are the engine-house, pumps, and working platform. There are sometimes gates at the ends for inclosing the dock, which are used only when vessels of great weight are to be lifted. Of this description is the Portsmouth, Va., navy-yard dock, which is 350 feet in length, 38 feet in depth, and 90 feet in inside width. This dock, with the basin and railways, cost $733,000. The Pensacola dock, which is similar, cost $923,000. There are also balance docks at New York, Charleston, Savannah, Mobile, and New Orleans.

The iron floating dock at Ireland island, Bermudas, was built in England and towed out in 1869. It is 381 feet in length, by 124 feet in breadth, weighs without the caissons about 8,200 tons, and has a lifting power of 16,700 tons.

Iron floating docks at Cartagena and Ferrol, Spain, constructed by the Messrs. Rennie, of England, are remarkable works. That at Cartagena is 320 feet in length; 105 feet in breadth outside; breadth inside, 79 feet; height outside, 48 feet; height inside, 36½ feet; weight 4,400 tons. This dock, possessing many points of resemblance to Gilbert's balance dock, may be described as an oblong rectangular box or trough, without top or ends; walls and bottom hollow, and

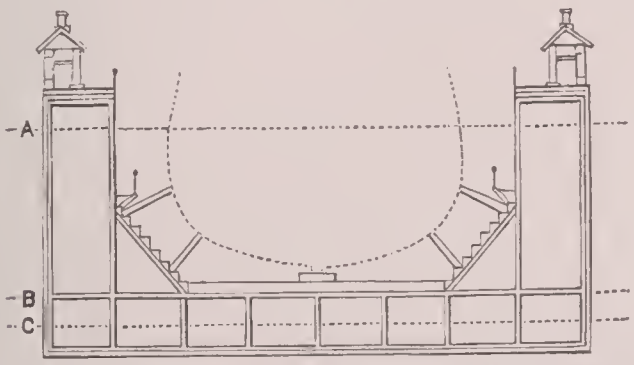


FIG. 5.—End elevation of Rennie's dock. A, level of water when ready to receive a ship; B, level of water with ship docked; C, level of water when light.

divided into several independent chambers; the side walls act as floats to prevent the dock from sinking too rapidly, and eventually from being entirely submerged. The operation of docking is performed thus: Water is admitted to the base compartments by sluices and pipes; the dock gradually sinks to a depth sufficient to admit the vessel, which is then hauled in and shored in the usual manner; the engines and pumps then discharge the water from the base compartments until the floor of the dock is out of water.

Among the largest vessels which this dock has lifted is the Spanish iron-clad Numancia, of 21¼ feet draught and weighing 5,600 tons. This vessel remained supported eighty days without damaging or straining the dock. The draught of water of the dock, with the Numancia in, and with 800 tons of water in the chambers, was 11¼ feet; without a load the draught of the dock is 4 ft. 7 in.

For a description of the hydraulic lift and carriage for transporting vessels across the isthmus of Tehuantepec as proposed by James B. Eads, see the article on SHIP-RAILWAYS.

Clark's hydraulic lift dock, first constructed by Mr. Edwin Clark, at the Victoria Docks, London, consists of a shallow pontoon filled with water and sunk between two rows of cast-iron columns. The pontoon, when the vessel is placed over it, is raised by hydraulic pumps acting on the pontoon by chains. In about thirty minutes a vessel drawing 20 feet of water is left afloat on a shallow pontoon drawing only 4 or 6 feet, and may be taken into the shallow dock prepared for its reception.

A plan has been proposed by a Mr. Janicki before the French Society of Engineers for a floating dock composed of a number of pontoons from which the water is driven by compressed air, stability being given to the pontoons by lateral moving floats.

BIBLIOGRAPHY.—*Professional Papers United States Corps of Engineers*; *Reports of Secretary of War and of Secretary of Navy*; *Proceedings Institution of Civil Engineers*; London *Engineering News*; *The Engineer*; *Engineering*; *Société des Arts et Métiers*; *Société des Ingénieurs Civils*; *Harbours and Docks*, Hareourt (London, 1885), etc.

Revised by LEWIS M. HAUPT.

Doctor [Lat., teacher, deriv. of *doce're*, *doctum*, teach]: a title of honor which was applied in early times to teachers of doctrine in the churches, and in more recent times conferred by universities; at first as the equivalent of "master" (*magister*), and afterward as a still higher degree. Four of the Greek Fathers (Athanasius, Basil, Nazianzen, and Chrysostom) and three Latin Fathers (Jerome, Augustine, and Gregory the Great) were distinguished as "doctors of the Church." Thomas Aquinas, Bernard of Clairvaux, Bonaventura, and others bore the same title in later days. The distinction is usually conferred after death. The title "doctor" was given later in the Western Church to prominent teachers of scholastic theology. Many of these titles were conferred by their followers, and had an additional epithet, designed to be expressive of some special excellence. Thus William Hales was called "Doctor Irrefragabilis"—the irrefutable doctor. William Ockham was called by his admirers "Doctor Singularis"—the pre-eminent doctor—a title given to several others. Doctor of laws, LL. D. or J. U. D. (*doctor utriusque juris*, teacher of both laws, i. e. the civil and the canon law), was the first title of the kind conferred by the universities. Bologna appears to have been the place where this title was first conferred, but the University of Paris soon followed, first giving this degree in 1145. Doctors of laws (except when bearing a merely honorary title) long had a certain jurisdiction in the courts, which is even now scarcely extinct in England. (See Shakspeare's *Merchant of Venice*, act iv., scene i.) In the English universities the doctorate in law is given in course at Oxford under the form D. C. L., and at Cambridge and London under the form LL. D. The degree of S. T. D. (*Sacrosanctæ Theologiæ Doctor*, i. e. Teacher of Sacred Theology) or D. D. (Doctor of Divinity), otherwise written T. D. (Doctor of Theology), is still given at all the European universities after examination in the regular university course. The popes and archbishops of Canterbury have long claimed and exercised the right of conferring the doctorate both in law and divinity. The degree of doctor in medicine has been traced back to 1384, and that of doctor of music is nearly or quite as old. The regents of the University of the State of New York confer the honorary degree of Doctor of Letters (L. H. D.) as their highest distinction. See DEGREES, COLLEGE, UNIVERSITY, BERLIN, UNIVERSITY OF, and descriptions of the various other universities.

The word "doctor" as used in the New Testament is taken in its primitive Latin meaning, "teacher," and corresponds to the Hebrew word *mori* (teacher) or to the title *rabbi* (master), which was conferred during the centuries immediately preceding and following the birth of Christ by the "nasi," the chief of the Sanhedrim, accompanied by the ceremony of the laying on of hands.

Revised by C. H. THURBER.

Doctor of Music: the superior of two musical degrees conferred by the English universities, the inferior being that of *Bachelor of Music*. At Cambridge and Oxford five years must elapse before a Bachelor of Music can receive the degree of Doctor of Music. The *honorary* degree has sometimes been conferred on distinguished musicians who had not graduated as bachelors. The following are the published conditions for Oxford: "Candidate must compose and send to professor a vocal composition, secular or sacred, in eight-part harmony and good eight-part fugal counterpoint with accompaniment for full orchestra. Length of performance, forty to sixty minutes." If this "exercise" be approved, a *written* examination follows, in "harmony, eight-part counterpoint, fugue, form, instrumentation, musical history, acoustics, so far as related to theory of harmony, and knowledge of the scores of great masters." If the candidate passes this examination satisfactorily, *then* he "must have his exercise publicly performed in Oxford, with complete band and chorus *at his own expense*. He must furthermore deposit the manuscript full-score in the library of the music school. Fees for this degree, £20." Conditions, fees, etc., at Cambridge and Dublin are about the same as at Oxford. The Archbishop of Canterbury still possesses by law the right to confer the title of Doctor of Music by diploma without special examination. The only condition appears to be the payment of £63 in fees. Germany and France confer no such degrees.

In the U. S. many colleges confer this degree oftentimes without technical examination, so that the title no longer implies any specially learned or scientific standing in the profession. DUDLEY BUCK.

Doctors' Commons, or **College of Doctors' Commons**: in London, England, the popular name for the courts, offices, etc., formerly occupied by the body which was incorporated June 22, 1768, under the title of "The College of Doctors of Law exercent in the Ecclesiastical and Admiralty Courts," and which had previously existed for more than two centuries as a voluntary organization. These buildings were on the east side of St. Paul's Churchyard, and were so called in allusion to the "community of board," or dining together, of the members of the college. The college consisted of a president (the dean of the arches for the time being) and of those doctors of law who, having regularly taken that degree in either the Universities of Oxford or Cambridge, and having been admitted advocates in pursuance of the rescript of the Archbishop of Canterbury, had been elected fellows of the college in the manner prescribed in the charter. The functions of this body of lawyers were much diminished by laws passed to reform the system of courts, and the property of the college was sold, the charter surrendered, and the corporation dissolved under powers conferred by statute in 1857 (20 and 21 Vict. c. 77, ss. 116, 117). Revised by F. STURGES ALLEN.

Doctors of the Church: in the Roman Catholic Church, certain saints who, after death, have received this title on account of their superior wisdom and excellence. They are at present nineteen in number, viz.: Sts. Hilary of Poitiers (d. 368 A. D.), Athanasius (373), Basil (379), Gregory Nazianzen (389), Ambrose (397), John Chrysostom (407), Jerome (420), Augustine (430), Peter Chrysologus (450), Leo (460), Gregory (604), Isidore (636), Peter Damian (1072), Anselm (1109), Bernard of Citeaux (1153), Thomas Aquinas (1274), Bonaventura (1274), Francis de Sales (1622), and Alphonsus of Liguori (1787). Outside the Roman Catholic Church the seven Christian Fathers mentioned in the article DOCTOR (*q. v.*) are more especially designated by the title "Doctors of the Church."

Doctrinaires, dok-tri-nãrz': the politicians who, in France, just after the restoration of 1815 occupied in the Chamber of Deputies a place between the Center and the Extreme Left. The chief men of this party were systematic writers and speakers on government, who wished to establish a form of constitution somewhat resembling that of England, and supported scientific doctrines of constitutional liberty against the arbitrary will of the king. The word *doctrinaire* was used by their opponents to stigmatize them as pedantic and unpractical theorists. The leaders of the Doctrinaires were Royer-Collard, Guizot, the Due de Broglie, and the Duc de Decazes. They ceased to exert any influence as a party after the revolution of 1848. The term is now frequently used to designate the partisans of abstract theories, the direct opposites of "practical politicians."

Document [from Lat. *documen'tum*, proof, example, i. e. something from which one learns; deriv. of *doce're*, teach]: an original or official paper or writing relied on as the basis or proof of something; in law, a written instrument adduced for the purpose of evidence.

Dodd, CHARLES: the assumed name of Hugh Tootel, a Roman Catholic priest of England; b. at Durton-in-Broughton, near Preston, Lancashire, 1672; educated at Douay; returned to England 1698, and had two charges, the last at Harvington, where he died Feb. 27, 1742–43. He was the author of *Church History of England* from 1500 to 1688 (3 vols. folio, Brussels, 1737–42), and several other works, chiefly polemical. His history was a reply to that of Burnet, and has been in part republished down to 1625 (5 vols., London, 1839–43). Its value is regarded as considerable, but it is characterized by severity and unfairness.

Dodder-laurels (*Cassythaceæ*): a family of parasitic plants having the habit and appearance of dodders, but in other respects resembling the laurels, to which they are generally referred. They replace the dodders in hot regions, where alone they grow. The U. S. have but one known species, the *Cassytha filiformis* of Florida.

Dodders [O. Eng. *dodder*: Germ. *Dotter*, connected with O. Eng. *dott*, point, spot, Eng. *dot*, point]: leafless parasitic plants, generally placed by botanists in the genus *Cuscuta* and family *Convolvulaceæ*, but sometimes made a distinct family called *Cuscutaceæ*. They have twining thread-like stems of orange yellow, and flowers in thick clusters. They are found native in the temperate zone, in both the Old and New Worlds, and are sometimes injurious to the flax, clover, hop, and bean crops by smothering the plants. The dodders are remarkable for having their embryos without cotyledons. On germinating the slender stem grows up from the ground, and having attached itself as a climbing parasite to herbs and shrubs the proper root dies, leaving the vine to subsist upon the juices of the plant which supports it. This it does by means of papilla-like roots, which penetrate the bark of the plant on which it lives. Huge dodders in Afghanistan grow upon the trees, and even prey upon themselves. About twenty species are known in North America, growing upon many herbaceous plants and even a few shrubs. *C. arvensis* sometimes attacks clover in the U. S., while *C. epithymum*, a foreign species, is very destructive to clover in Europe, and is sparingly introduced into the U. S. *C. epilinum*, another foreign species, is occasionally found in flax-fields in the U. S. Revised by CHARLES E. BESSEY.

Doddridge, JOHN: jurist; b. at Barnstaple, England, 1555. He entered Exeter College, Oxford, in 1572, and began the study of law at the Middle Temple in 1576; was justice of the king's bench 1613–28. Author of *The Lawyer's Light* (London, 1629); *A Complete Parson, or a Description of Advowsons and Church Livings* (1602); *The History of the Ancient and Modern Estate of the Principality of Wales* (1630); *The English Lawyer* (1631); *Opinions Touching the Antiquity, Power, Order, State, Manner, Persons, and Proceedings of the High Courts of Parliament in England* (1656). D. in London, Sept. 13, 1628.

Doddridge, PHILIP, D. D.: preacher and author; b. in London, England, June 26, 1702. He became pastor of a Dissenting congregation at Kibworth in 1723, but left in 1725, went to Market Harborough, and removed in 1729 to Northampton, where he was principal of a theological seminary and at the same time pastor of a large congregation. In 1730 he married Mercy Maris. From principle he avoided controversy, but that course drew upon him the charge of being a trimmer and double-dealer. He was an earnest and devout preacher, and acquired a high reputation as a writer. His most important works are *The Rise and Progress of Religion in the Soul* (1745); *The Family Expositor* (6 vols. 4to, 1739–56); *Life of Colonel Gardiner* (1747); *A Course of Lectures on Pneumatology, Ethics, and Divinity* (1763); and *A Commentary on the New Testament*. He also was the author of improvements upon Jeremiah Rich's *Brief and Easy System of Shorthand* (1799). He wrote 374 hymns, some of which are admirable. D. at Lisbon (whither he had gone for his health), Oct. 26, 1751. See Job Orton, *Life of Doddridge* (London, 1766); Thomas Stedman, *Letters to and from Dr. Doddridge* (1790); *Correspondence and Diary*, edited by John Doddridge Humphreys (5 vols., 1829); especially the *Life* by Charles Stanford (London and New York, 1881).

Revised by S. M. JACKSON.

Dodec'agon [from Gr. δώδεκα, twelve + γωνία, angle]: a regular polygon of twelve equal sides and twelve equal angles.

Dodecahe'dron [from Gr. δώδεκα, twelve + ἕδρα, seat, base]: one of the five Platonic bodies or regular solids, bounded by twelve equal and regular pentagons; has thirty equal edges and twenty equal solid angles, each formed by the meeting of three equal plane angles. Its volume is nearly 7·66312 times that of the cube of one of its sides.

Dodeca'theon [Lat. *dodecatheon*, plant of the twelve gods; from Gr. δώδεκα, twelve + θεός, god, probably in allusion to its curious nodding flowers, about twelve in number]: a genus of plants of the family *Primulaceæ*. The *Dodecatheon meadia* of the U. S. is an elegant plant called American cowslip, or shooting star.

Döderlein, Ludwig: pedagogue and classical scholar; b. in Jena, Dec. 19, 1791; son of Johann Christoph, a Protestant divine; studied philology in Munich, Heidelberg, Erlangen, and Berlin. In 1815 he became professor in Bern, where he published, together with Bremi, a large number of exegetical editions of the Greek and Roman classics. In 1819 he went to Erlangen in the double capacity of director of a gymnasium and professor at the university. D. Nov. 9, 1863. Apart from his elegant translations and eloquent orations, his reputation rests on his lexicographical labors, in particular on his *Lateinische Synonyme u. Etymologien* (6 vols., 1838). See R. Rauchenstein, *N. Schweizer Museum* (iv., pp. 155–280); Bursian, *Allgemeine deutsche Biographie* (v., p. 281 f.).

Dodge, Charles Richards: See the Appendix.

Dodge, Ebenezer, D. D., LL. D.: a Baptist divine and scholar; b. at Salem, Mass., Apr. 22, 1819; graduated at Brown University in 1840, and at Newton Theological Institution in 1845; instructor in Hebrew at Covington Theological Institution (1846–47); pastor in New Hampton, N. H. (1847–48); New London, N. H. (1849–53); professor in the theological department of Madison University, Hamilton, N. Y. (1853–68); and president of the university from 1868 till his death, Jan. 5, 1890. He published *Evidences of Christianity* (Boston, 1869); *Christian Theology* (Hamilton, N. Y., 1883); several able reviews, etc.

Dodge, Grenville Mellen, LL. D.: general; b. at Danvers, Mass., Apr. 12, 1831; graduated at a military academy in Norwich, Vt., in 1850; became a civil engineer and made one of the earliest surveys along the Platte for a Pacific railway; commanded a brigade at Pea Ridge in Mar., 1862, and became a major-general of Union volunteers in June, 1864. He directed a corps of Gen. Sherman's army in the campaign against Atlanta (May to Sept., 1864), and succeeded Rosecrans as commander of the department of Missouri in December of that year; resigned May, 1866, to become chief engineer of the Union Pacific Railway. He represented a district of Iowa as a member of Congress in 1867–69, and was a delegate to the Chicago Republican convention of 1868, and to the Cincinnati convention of 1876.

Dodge, Henry: general; b. at Vincennes, Ind., Oct. 12, 1782. He served with distinction in the War of 1812 and in various Indian wars; was Governor of Wisconsin Territory 1836–41 and 1845–48; a delegate to Congress (1841–45); and U. S. Senator from Wisconsin (1849–57). D. at Burlington, Ia., June 19, 1867.

Dodge, Mary Abigail (*Gail Hamilton*): author; b. in Hamilton, Mass., about 1830; was a school-teacher in her youth; in 1865–67 was one of the editors of *Our Young Folks*; in 1876 became a resident of Washington, D. C. Among her works are *Gala Days* (1863); *Woman's Wrongs, a Counter-Irritant* (1868); *Skirmishes and Sketches*, *The Battle of the Books* (1870); *Our Common-School System* (1880); and *The Insuppressible Book* (1885). She was a frequent contributor to current literature. D. Aug. 17, 1896.

Dodge, Mary Mapes: author; b. in New York city in 1838, daughter of Prof. James J. Mapes, an eminent chemist, and married to William Dodge. She has been since 1873 editor of *St. Nicholas*, a children's magazine. *Hans Brinker, or the Silver Skates* (1865), is the best known of her writings, which include also *Irvington Stories* (1864); *Along the Way*, poems (1879); *Donald and Dorothy* (1883), etc. H. A. Beers.

Dodge, Richard Elwood: See the Appendix.

Dodge, Theodore Ayrault: See the Appendix.

Dodge, William Earle: philanthropist; b. in Hartford, Conn., Sept. 4, 1805; removed to New York in his thirteenth year. At the age of twenty-one he went into business on his own account, and became an extensive importer and manufacturer. He was an active member of many benevolent and religious societies, a member of the peace convention of 1861, and a Republican member of Congress 1866–67. He was the principal founder of the Syrian Protestant College at Beirut. D. in New York city, Feb. 9, 1883. A statue of Mr. Dodge was erected in New York in 1885. See his *Life* by D. Stuart Dodge (New York, 1887) and by Carlos Martyn (New York, 1890).

Dodge City: city and railway center; capital of Ford co., Kan. (for location, see map of Kansas, ref. 7–D); on the Arkansas river. It has a Presbyterian college, graded schools, electric lights, water-works, etc. Pop. (1880) 996; (1890) 1,763; (1900) 1,942. Editor of "Times."

Dodgeville: city; capital of Iowa co., Wis. (for location of county, see map of Wisconsin, ref. 7–D); on Ch. and N. W. and Ill. Cent. Railways; 48 miles W. S. W. of Madison; has seven churches, public school with a high school department, and manufactures of wagons, buggies, plows, flour, and creamery butter; lead and zinc are mined in the vicinity. Pop. (1880) 1,547; (1890) 1,722; (1900) 1,865.
Editor of "Chronicle."

Dodgson, Charles Lutwidge, M. A.: author; b. in England about 1833; graduated at Christ Church College, Oxford, in 1854, with a first class in mathematics; took holy orders in 1861; was mathematical lecturer at Christ Church College 1855–81; published *Euclid and his Modern Rivals* (1879); *The Game of Logic* (1886); *Mathematica Curiosa* (1888); also, under the pseudonym of Lewis Carroll, *Alice's Adventures in Wonderland* (1865) and *Through the Looking Glass* (1872); besides other volumes of poems, parodies, and children's stories, including *Doublets* (1879); *Rhyme? and Reason?* (1883); and *Sylvie and Bruno* (1889). D. at Guildford, England, Jan. 14, 1898.

Dodo (*Didus ineptus*): a remarkable extinct member of the order *Columbæ* (pigeons) and family *Dididæ*; found only in the island of Mauritius. A closely related bird, the solitaire (*Pezophaps solitaria*), was found in Rodriguez, and what was probably a third member of the family in the island of Bourbon. The dodo is described as larger than a swan, of a clumsy form, with a large head and enormous bill, the upper mandible being the longer and hooked at the point, short thick legs covered with scales, and such extremely short, weak wings that the bird could not fly. With the exception of the wing feathers the plumage was soft and downy. The general color was gray, the breast brown, and the wings and tail yellowish. The flesh, though tough, was eatable, and dodos were taken in considerable numbers by the Dutch voyagers to provision their ships. Being incapable of flight, a poor runner, and withal stupid, the dodo was easily captured, and its extermination was rapid. By 1693, a little less than a century after the discovery of Mauritius, the dodo seems to have been exterminated, the last record of its occurrence being July, 1681. Up to 1866 the only known remains of the dodo consisted of a skull in Copenhagen, an imperfect skull in Prague, a foot in the British Museum, and a head and foot in Oxford. In 1866, however, a considerable number of bones were ob-

Dodo.

tained from a small marsh, termed the Mare aux Longes, and others have been procured still more recently. Our knowledge of the external appearance of the bird—aside from the descriptions of voyagers—is based on the paintings of Roelandt and John Savary, who drew the dodo from examples brought alive to Holland. F. A. Lucas.

Dodo'na (in Gr. Δωδώνη): an ancient city of Epirus; seat of a celebrated oracle and temple of Jupiter, for a time the most famous oracle of Greece except that of Delphi. Its origin was attributed to Deucalion. This oracle was consulted by the Athenians, Spartans, and other nations, and its responses were delivered from an oak-tree; or, according to another legend, by the agitation of a row of kettles suspended in the air, the noise of which was interpreted by priests as the answers of the oracle. The temple of Dodona was destroyed by the Ætolians in 219 B. C.

Dods, Marcus, D. D.: Scottish divine of liberal tendencies; a minister of the Free Church of Scotland; b. at Belford, Northumberland, England, Apr. 11, 1834; educated at Edinburgh University (M. A. 1854) and at New College, Edinburgh (1854–58). He became pastor of the Renfield Free Church, Glasgow, 1864; Professor of New Testament Exegesis in New College, Edinburgh, 1889. Among his published works are the following, some of which have passed through several editions: *The Prayer that Teaches to Pray* (Edinburgh, 1863); *The Epistles to the Seven Churches* (1865); *Israel's Iron Age* (London, 1874); *Mohammed, Bûddha, and Christ* (1877); *Handbook on Haggai, Zechariah, and Malachi* (Edinburgh, 1879); *Isaac, Jacob, and Joseph* (London, 1880); *Handbook on Genesis* (Edinburgh, 1882); *Commentary on Thessalonians* (1882); *The Parables of Our Lord* (1st series, 1883; 2d series, 1885); *Introduction to the New Testament* (London, 1888); *The Book of Genesis* (1888); *The First Epistle to the Corinthians* (1889); *Erasmus and other Essays* (1891); *The Gospel of St. John* (2 vols., 1891–92). Willis J. Beecher.

Dodsley, Robert: bookseller and author; b. near Mansfield, England, in 1703. He opened a book-store in London, and became a friend of Pope and other literary men of his time. He produced in 1737 a farce called *The King and the Miller of Mansfield*, which was successful. His tragedy of *Cleone* (1758) was performed with great applause. He purchased Dr. Johnson's *London* for ten guineas, and his *Vanity of Human Wishes* for fifteen guineas. He published a *Select Collection of Old Plays* (12 vols., 8vo, 1780) and other works. D. Sept. 25, 1764.

Dodwell, Henry: chronologist; b. in Dublin, in Oct., 1641; educated at Trinity College, Dublin: elected Camden Professor of History at Oxford in 1688, but deposed from his chair in 1691 because he refused to take the oath of allegiance to William III. Among his noteworthy contributions to Greek and Roman chronology are his *Annales Velleï, Quintil., Statian.* (1698); *Annales Thucyd. et Xenophont.* (1702). D. in Schottesbrook, June 7, 1711. See Dodwell's *Works*, abridged, with an account of his life, by Fr. Brokesby (2 vols., London, 1723). Alfred Gudeman.

Doe, Charles: See the Appendix.

Doe, John: a name in legal documents for a person whose name is unknown; specifically, the fictitious plaintiff in Ejectment (*q. v.*).

Doebereiner: See Döbereiner.

Dogbane: a plant of the genus *Apocynum* and family *Apocynaceæ*, having bell-shaped flowers, no style, and the fruit a pair of follicles. Some of the species are herbaceous, others shrubby, and some are found in colder climates than is usual for plants of this order. The dogbane of North America (*Apocynum androsæmifolium*) is a perennial herbaceous plant about 2 feet high, with smooth stem, milky juice, smooth ovate leaves, and light-pink flowers. It grows in open, barren places from Canada to Georgia, and is valued for the medicinal properties of the bark of the root, which is emetic, diaphoretic, and in small doses tonic. This and the Indian hemp (*A. cannabinum*), which contains similar medicinal properties, yields a copious fine flax-like fiber, used by the Indians; but otherwise the plant is employed only for medicinal purposes.

Dog Days, or **Canicular Days**: the forty days between July 3 and Aug. 11. Canicular is derived from *Canicula*, the Latin name of Sirius, the dog-star, which rose heliacally near July 1. The ancients ascribed the great heat of summer to the influence of this star, but it was by accident only that its rising coincided with the warmest season. The time of its rising depends on the latitude of the country, and, owing to precession, is later every year.

Dog Distemper: a disorder common among young dogs, considered to be of a catarrhal character. A general running from the nose and eyes is a leading symptom, together with a short dry cough, succeeded by loss of strength and wasting of the body. The flow from the nose, at first watery, in a little time becomes mucous and purulent, filling the eyes and choking up the nostrils, and is attended by coughing and vomiting, with an increased wasting of flesh and loss of appetite. A convulsive twitching, paralysis of the extremities, attended by fits, with symptoms of an affection of the brain, appear when the disease becomes malignant. At such a time the sight of another dog often brings on a fit, which may be somewhat checked by fondling. The fits usually prove fatal if they continue to increase in violence and frequency. A frequent consequence of the distemper is inflammation of the lungs and a dysenteric discharge, indicating ulceration of the intestines.

The leading remedies, which must be applied in the early stage of the disease, are laxatives, emetics, occasional bleeding, etc. Astringents should be used to check the diarrhœa, and the violence of the fits may be quelled by warm baths and anodynes.

Doge, dōj [Ital. < Lat. *dux, ducis*, leader]: the title of the chief magistrate in the republics of Venice, Amalfi, and Genoa. The origin of the office in Venice dates as far back as 697. Previously Venice had been governed by seven tribunes, but the intrigues consequent on their election, and the rising power of the republic, made it expedient to concentrate the power of the government. The first doge was Paoluccio Anapeste. The doges were elected by the people, but the choice usually fell on a member of one of the powerful families. They were invested with almost absolute power till about the year 1172, when the legislative power was placed in the hands of a great council of 470 members. This council elected twenty-four of their members, who in turn elected twelve of their own number, upon whom the choice of the doge devolved. The first doge elected in this manner was Sebastiano Ziani, who, on the occasion of his installation in office, scattered money among the people to win their favor—a custom which was followed by his successors. This doge also introduced the custom of wedding the Adriatic Sea. This was a marriage ceremony which took place on Ascension Day, and which typified the absolute dominion which the Venetians claimed over that sea. On these occasions a ring was thrown into the sea from the ship Bucentaur. The principle of indirect election has probably never been carried to such absurd lengths as by the electoral machinery established in 1268. Ten or twelve bodies of voters were successively chosen before the actual electors were reached. From this time the council gradually narrowed the powers of the doge, till in 1628 the offices of commander-in-chief of the army and high-admiral of the navy ceased to belong to the dogate (or dogado, as the dignity was called) unless by a special decree of the council of forty, a high court of justice composed of forty members. In the fourteenth century the council of ten was established, and vested with the highest power in the state, which entitled it to pass judgment even upon the doge himself. About this time the powers of the doge became so restricted as to be little more than nominal, and the constant espionage to which he was subjected made the office no longer an object of ambition. In 1339 it was found necessary to pass a law prohibiting a doge who had been elected from resigning his place. The office disappeared with the fall of the Venetian republic in 1797. Lodovico Manin, elected in 1788, was the seventy-third and last doge of Venice.

The first doge of Genoa was Simon Boccanera, elected by the people in 1339. Like that of the Doge of Venice, his office was originally for life. His powers were shared, though not restricted, by twelve aldermen. In 1528 the Genoese framed a new constitution, by which the doge was to be re-elected every two years, and the powers of the office were restricted by two councils, of which one comprised 300 and the other 100 members. In 1797, when the French occupied Genoa, the office of doge ceased to exist. In 1802 it was restored with the restoration of the republic, but it finally disappeared in 1804. The republic of Amalfi in 897 A. D. exchanged its government by annually chosen consuls for the dogate, which was held for life; but its republican government ceased in 1350. Revised by F. M. Colby.

Dogfishes: popular name of several small species of shark, so named probably from their pursuing their prey like dogs hunting. The common dogfish, *Squalus acanthias*, is found in great quantities on the coasts of the Hebrides and Orkneys. The same species is abundant along the New England coasts and on the Pacific coast northward. It is everywhere caught for its oil. Most of the small spotted sharks are known as dogshark or dogfish. The dogfish of the Western States is the Amia (*q. v.*).

Dog-fox: a small animal found in Asia and Africa, belonging to the family *Canidæ*, of the genus *Cynalopex*. It has erect pointed ears, a sharp muzzle, somewhat resembling that of a greyhound, and a bushy tail.

Dog'ger [Dutch *dogger*, codfish]: a two-masted fishing-boat of the ketch build, with bluff bows. It is used by the Dutch for the Doggerbank fishery.

Doggerbank: an extensive sandbank in the middle of the German Ocean, between England and Denmark. Length about 170 miles; average width, 40 miles. In some parts it is covered with only 8 fathoms of water. Here are important cod-fisheries. An indecisive battle was fought here between the Dutch and English fleets in Aug., 1781. See Mather, *Nor'ard of the Dogger* (1888).

Doggett, David Seth, D. D: bishop of the Methodist Episcopal Church South; b. in Lancaster co., Va., June 26, 1810; educated at the University of Virginia; entered the itinerant ministry in the Virginia Conference of the Methodist Episcopal Church in 1829. He was professor in Randolph-Macon College, Virginia, 1841–46, and was consecrated bishop in 1867, from which time his residence was in Richmond, Va. He wrote *The War and its Close* (Richmond, 1864). D. in Richmond, Va., Oct. 27, 1880.

Dog Island Light: a revolving light, 45 feet above the water, on the southern coast of Florida; lat. 29° 46′ 51″ N., lon. 84° 38′ 37″ W. The island is 30 miles E. of Appalachicola, and the light is a mile E. of its western end.

Dogma [Gr. δόγμα, an opinion, that which seems good, a decree, deriv. of δοκεῖ, it seems good, δέδοκται, it has been determined]: originally an opinion, afterward an article of belief derived from authority. The term is sometimes applied to what are regarded as the essential doctrines of Christianity, as contained in the Scriptures or the writings of the Fathers of the Church. The study or science of dogmas (*Dogmatik*) has a separate professorship in the Protestant universities of Germany. The term doctrine is a preferable one, as dogma is coming more and more to be used in an unfavorable sense.

Dogs: the *Canidæ* in general, but usually only the domesticated races which are considered as different varieties of one species—*Canis familiaris*. The domestication of the dog took place at an early date; he is mentioned by Homer, pictured on Egyptian monuments 5,000 years old, his bones occur in the neolithic shell-heaps of Europe and America, and, like his master's, his origin and early history are largely conjectural. As the various races of man are supposed to have had a common origin, so modern dogs are, by some, believed to be the descendants of one ancient and wild species. It seems, however, more probable that various species of wild dogs have been tamed in different parts of the world, and that the wolf, coyote, and jackal have been the chief sources whence come the many breeds of dogs, although others have been domesticated. These three species when young are easily tamed, and are playful, cross with domesticated dogs and produce fertile hybrids, and, although comparatively silent in their wild state, learn in captivity to bark, while dogs that run wild lose the habit. Foxes can scarcely have been among the progenitors of the dogs, since, according to Bartlett, there is no well-authenticated case of a cross between the dog and fox. The length of time that dogs have been domesticated, the various purposes for which they are used, and the demands of fashion have given rise to the numerous breeds of dogs, which can not be far from 200. The variation among them is immense—in size, from the toy terrier of 2 lb. or less to the St. Bernard of over 150 lb.; in shape, from the bow-legged bulldog and crook-limbed dachshund to the slender greyhound; in disposition, from the gentle Chinese sleeve-dog to the savage Tibet mastiff. This great variation prevents any exact classification, since between any two extremes intermediate forms can be found. Cuvier divided dogs into three groups, mainly according to the shape of the head, proportions of parietal bones, size of frontal sinus, and size and shape of brain cavity; but more recent writers have arranged them in races according to external characters, dividing them into Wolf-dogs, Greyhounds, Spaniels, Hounds, Mastiffs, and Terriers (*qq. v.*).

The Eskimo, collie, and Newfoundland are examples of *wolf-dogs*, the first named with its pointed muzzle, erect ears, and savage disposition, being indeed little removed from a wolf. The Newfoundland is regarded as either the result of a cross between the Indian dogs and those introduced by the English settlers or as descendants of dogs brought over by early Norwegian visitors. The breed is at a low ebb in Newfoundland and at its best in England. The Leonberg is a cross between the Newfoundland and St. Bernard, this last being also included in the wolf-dogs. The original St. Bernards were exterminated by a distemper in 1820 and replaced by the present breed, whose long-haired variety has been brought to an enormous size by English breeders. The *greyhounds* are an old race, a breed with curled tails being portrayed on Egyptian monuments 3,000 years old. In feudal England the greyhound could be kept only by princes and nobles, and to kill one was punishable with death. The coarse-haired deerhound is a lineal descendant of an Irish dog used in hunting wolves and red deer, and approaches the staghound very closely, although this last is placed with the hounds. Greyhounds hunt almost entirely by sight, speed and wind having been cultivated at the expense of other qualities.

The *spaniel* group includes the various spaniels and setters, the latter being a comparatively recent breed derived by selection from the former. Few setters now "set," although this name was given them from their indicating the presence of game by crouching instead of pointing, like the pointer. In both the habit has been brought about by man's taking advantage of the stealthy creep or brief pause of the wild dog before making a sudden rush and bringing it to a full, long-continued stop.

To the *hounds* belong the bloodhound, pointer, and related breeds, the group including those dogs which have the keenest scent, and rely on their noses rather than on their eyes. Many of them are noteworthy for speed and "staying" qualities, foxhounds having been known to make 4 miles in seven minutes, and to keep on the run for ten consecutive hours. The pointer bears evidence of his Spanish origin in names like Don and Carlo, which still cling to him.

The *mastiffs*, characterized by shortness and breadth of muzzle and generally robust form, comprise such well-known forms as the now popular English mastiff, bulldog, and pug. The race of mastiffs is an old one, figured on Assyrian monuments of 640 B. C., and represented in statuettes of clay bearing such names as "biting his enemies," "capturing enemies," and "causing evil to come forth," names which refer to the use of these dogs in war. The present tendency is to breed mastiffs of a more slender, "leggier" build than formerly. The bulldog is no longer used for bull-baiting, and is to a great extent bred for show purposes.

Lastly, the *terriers* comprise a number of small, active, and greatly varied breeds. The name comes from the Old French, in allusion to their digging habits, and they were formerly used in conjunction with foxhounds to dig out foxes when run to earth.

The uses of dogs are manifold. They serve as beasts of burden, and in the icy North furnish the sole means of winter travel. They participate actively in the sports of civilized man, and aid their savage masters in the chase, while among some tribes they not only help to obtain food, but are themselves cooked and eaten, as in the days of the Incas and Aztecs, when a special breed was regularly kept for this purpose, and fed exclusively on vegetable diet.

Wild dogs, descended from the domesticated breeds, occur in various parts of the world; a well-established race is found in Cuba, and others in Africa and South America, while even the pariah or street dog of the East has so far become a distinct breed as to have certain cranial characters of his own.

F. A. Lucas.

Dog's-tail Grass: (1) a grass of the genus *Eleusine*, and (2) a grass of the genus *Cynosurus*. Species of both genera are found native in Europe and Asia. The crested dog's-tail grass (*Cynosurus cristatus*) is much prized in England for lawns and sheep-pastures. The *Eleusine indica* is extensively naturalized in the U. S.

Dog Star: a popular name of Sirius (*q. v.*), a star of the first magnitude in the constellation Canis Major, and the brightest fixed star in the firmament.

Dogtooth Spar: certain pointed crystals of calcareous spar, somewhat resembling the teeth of a dog.

Dog-watch: on shipboard, a short watch of two hours. There are two dog-watches—the first from 4 to 6 o'clock P. M., and the second from 6 to 8 P. M.

Dogwoods: small trees of the genus *Cornus* and family *Cornaceæ*, which includes the cornel trees or dogwoods of Europe, the *Cornus florida* of the U. S., and others. The larger species are characterized by their hard wood, which is useful in turnery, and by their bitter tonic bark. The *Cornus florida* is well known for its white, showy involucral blossoms, appearing in May and June. In the West Indies, etc., other trees are known as "dogwoods." One of these, the *Piscidia erythrina*, or Jamaica dogwood, a small leguminous tree, found also in Florida, has a valuable and very hard timber. Its bark is a powerful narcotic and anodyne poison, which has been introduced into medicine and used quite largely to take the place of opium for the relief of pain. It is not a very successful substitute.

The "poisonous dogwood" or "poison sumach" (*Rhus venenata*) is probably much the most poisonous to the touch of the native plants of the U. S. It closely resembles the *Rhus vernix* or varnish-tree of Japan, and may be distinguished from the harmless sumachs by its panicles, which are loose (not thyrsoid or closely clustered in a spike, like the harmless ones), and which are axillary, while those of the harmless species are terminal. (See Rhus.) The common dogwood of Europe, *Cornus sanguinea*, which is found also in Northern Africa, is a shrub of 14 to 15 feet in height, with greenish-white flowers of an unpleasant odor.

Dohrn, Anton: zoölogist; b. at Stettin, Prussia, Dec. 29, 1840; studied natural sciences in several universities, finishing his course at Jena. He then applied himself to the study of the crustaceans of the English coast and the shores of the Mediterranean, and in 1870 founded a zoölogical laboratory at Naples which, within the next ten years, became one of the most noted establishments of its sort in the world. Among his writings are *Der Ursprung der Wirbelthiere* (Leipzig, 1875) and *Studien zur Ungeschichte des Wirbelthierkörpers* (1882). F. M. Colby.

Dojsi, Giovanni: Italian painter. See Dossi, Giovanni.

Dolabel'la, Publius Cornelius: a profligate Roman patrician; b. about 70 B. C.; married Cicero's daughter Tullia. He fought for Cæsar at Pharsalia in 48 B. C., and became consul about the year 44. He was afterward a partisan of Antony, was defeated by Cassius in Syria, and killed himself in 43 B. C.

Dolby, Charlotte Helen: See Sainton-Dolby.

Dolce, dōl'chā, Carlo: painter of sacred subjects; b. in Florence in 1616. His powers were feeble and his feeling limited, but his work is popular with the masses on account of its smoothness and elaborate finish, and its religious sentiment, which at best is weak. His pictures are chiefly small ones of madonnas and saints. D. Jan. 17, 1686.

Dol'cinites, or **Dul'cinists**: a sect of the Apostolici (*q. v.*), founded by Segarelli during the latter half of the thirteenth century, but deriving its name from his abler and more distinguished successor, Dolcino, an Italian born at Novara in the thirteenth century. They opposed the popes, and, according to Milman, held kindred tenets with the Fraticelli or Spiritual Franciscans, with some leaven of the old doctrines of the Patarines (Puritans) of Lombardy. Dolcino and some of his followers were burned alive in 1307.

Dole, Sanford Ballard: jurist; b. in Honolulu, Hawaii, in 1844. He was the son of an American missionary who went from Maine to Honolulu in 1840; received his early education in Punahan College; came to the U. S. in 1866, and studied in Williams College a year; studied law, and was admitted to the bar in Boston; practiced in Honolulu from 1870 till 1887; and then became a judge of the Supreme Court of Hawaii. On the abrogation of the Hawaiian monarchy in Jan., 1893, he was chosen president of the provisional government, and on the proclamation of the republic of Hawaii on July 4, 1894, he became its chief executive. When the islands were annexed to the U. S. on Aug. 12, 1898, President Dole and his administrative and judicial officers were continued as the government of the Territory.

Dolerite: See Basalt.

Dolet, dō'lā', Étienne: author; b. at Orleans, France, in 1509, probably on Aug. 3. He lived at Lyons, where he established a printing-press and published able works on theology and other subjects. His writings were burned by order of Parliament as heretical in 1543. He translated some works of Plato and Cicero, and wrote a great work, *Commentariorum Linguæ Latinæ* (1536), which has an important place in the history of Latin lexicography. He was first hanged and then burned in Paris, in the Place Maubert, on a false charge of heresy, Aug. 3, 1546. On the scene of his martyrdom a bronze statue of him was erected in 1890. See his *Life*, by Joseph Boulmier (Paris, 1857), and by R. C. Christie (London, 1880); cf. also A. Firmin-Didot, *Essai sur la Typographie*. Revised by A. R. Marsh.

Dolgelly, dol-geth'li: market-town of Wales; capital of the county of Merioneth; on the Wnion, here crossed by a bridge, 46 miles W. of Shrewsbury (see map of England, ref. 9–E). It is in a rich valley at the foot of Cader Idris, and is surrounded by beautiful scenery. It has manufactures of coarse woolens and flannels. Here in 1404 Owen Glendower signed a treaty of alliance with Charles VI. of France. Pop. 4,000.

Dolgoruki: name of one of the oldest princely families of Russia, connected with the present ruling dynasty by the marriage of Maria Dolgoruki to the Czar Michael in 1624, and having at different times exerted great influence in the imperial court. In the reign of Peter the Great the most prominent member of the family was Yakov Federovitch, who served as chief of the first formal embassy sent to France and Spain (1687), fought against the Turks (1696–97), winning honor at the siege of Azov, was captured at the battle of Narva (1700), and held a prisoner for ten years. Upon his release he was made a senator, and held other important dignities till his death in 1720.—Vasili Vladimirovitch, also a soldier and a diplomatist, rose to the rank of major-general, was banished in 1718 for suspected disloyalty, but recalled by Catherine in 1726, and placed in command of the army in the Persian war. Peter II. gave him the rank of field-marshal, but in 1739 he was imprisoned on a frivolous charge. He was released in 1741, and reinstated in his former dignities. D. 1746.—His nephew Vasili conquered the Crimea in a remarkably brief campaign, and received the title of krimskoi from the empress.—Peter Vladimirovitch, author, was born 1807, wrote a number of political works, of which *La vérité sur la Russie* (Paris, 1860) caused his banishment and the confiscation of his estates. He also wrote *La France sous le régime Bonapartiste* (Paris and London, 1864); *De la question du servage en Russie* (Paris, 1861); and *La question russo-polonaise et le budget russe* (Leipzig, 1861). D. at Geneva, 1868. Two volumes of his *Mémoires* were published after his death (Geneva, 1869–71).

F. M. Colby.

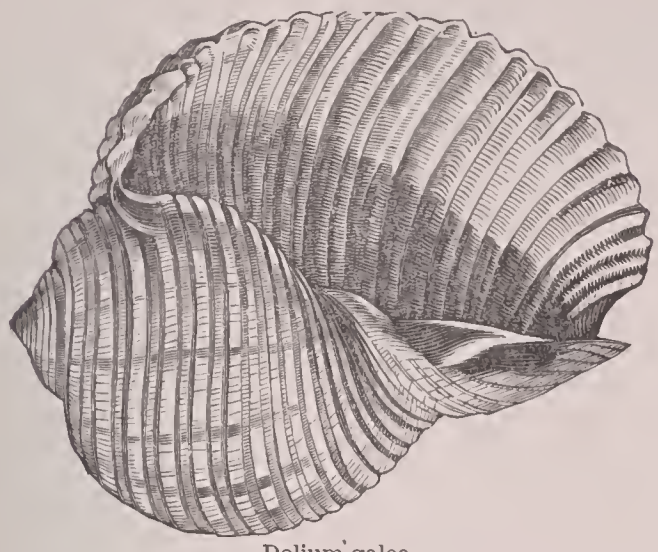
Dolgoruky, Katharina, Princess: favorite of the Czar Alexander II., whose determination to contract a morganatic marriage with her caused much unhappiness in his family. The marriage nevertheless soon followed the death of his first wife, Marie. After the czar's assassination the princess lived at Geneva, and published, in 1882, under the pseudonym of Victor Laferté, *Alexander II., Détails inédits sur sa vie intime et sa mort*.

Dolichocephal'ic [from Gr. δολιχός, long + κεφαλή, head]: long-headed; applied to human skulls which have the occipito-frontal diameter (that from the back to the front) much in excess of the transverse diameter. The native Australians and West African races afford extreme examples of this form of skull. Those skulls which have a relatively short occipito-frontal diameter are called *brachycephalic*—i. e. short-headed. Examples of both forms here noted are found among the remains of the prehistoric races of Europe. Which of the two types belongs to the earlier period is an unsettled question. Among the historic peoples of Europe the dolichocephalic form prevails among the Indo-European varieties, and the brachycephalic among the Finnic. See Wilson, *Prehistoric Annals of Scotland*, and Lubbock, *Prehistoric Races*, pp. 90–116.

Dol'ichos [Gr. δολιχός, long—in allusion to the length of the pods]: a genus of leguminous plants, allied to *Phaseolus*. They are natives of the East and West Indies, where the pods and seeds are used as food. The Chinese sauce called soy is made from the *Dolichos soya*, or soy bean, and the tuberous roots of some species are eaten in China. Other species are cultivated for the beauty of their flowers.

Do'lium [Lat., a large cask or jar]: a genus of gasteropod mollusks of the family *Doliidæ*, having spirally

furrowed shells, which suggest the hoops of a barrel. Some fourteen living species are found in the warm seas of the



Dolium galea.

eastern hemisphere, and several fossil ones, mostly from the Tertiary.

Doll [clip-form for *Dorothy*, cf. *Dolly*]: a toy made in the image of a child. Dolls have been in use from the earliest times, and those of the Greek and Roman children were buried with them when they died. Much ingenuity is often displayed in their construction, and some of the modern dolls can creep, walk, talk, and swim. Large quantities are manufactured in Germany, France, Switzerland, England, and the U. S.

Dollar [from the Low Germ. form of *Thaler*, a clip-form of *Joachimsthaler*, adjec. applied to name of coin, and denoting the place, i. e. Joachim's *dale* (in Bohemia) whence silver was obtained (fifteenth century)]: a gold or silver coin of different values current in the U. S., Canada, parts of Spanish America, and several countries of Europe. In the monetary system of the U. S. it is the unit of account. It was coined exclusively in silver until 1849, when the coinage of gold dollars was authorized. Its value was originally the same as that of the Spanish piaster of eight reals, but is now somewhat less. The law of 1837 fixes the weight of the silver dollar at 412½ troy grains, of which 371¼ are pure silver. The so-called trade-dollar, created by the act of 1873, weighed 420 grains, but it has not been coined since 1883. The further coinage of the standard silver dollar was prohibited by the act of 1873, but was resumed in 1878 under the Bland-Allison bill of that year, and was continued by the act of July 14, 1890, providing that the Secretary of the Treasury shall "purchase from time to time silver bullion to the aggregate amount of 4,500,000 ounces, or so much thereof as may be offered in each month." In accordance with the terms of this act, 4,898,369.18 fine ounces, costing $4,584,826.60, were coined into 6,333,245 silver dollars. The bullion value of the silver dollar at the average price of silver was $1·004 in 1873, but steadily depreciated till it stood at .724 in 1889. In 1890 it rose to .809, but fell to .674 in 1892, and has since declined. The market value of bar silver on June 16, 1893, was 83⅞ cents an ounce. The gold dollar weighs 25·8 grains = 1·672 grammes, and in exchange with Great Britain is usually estimated at 4*s*. 2*d*. The standard fineness for both silver and gold for coinage is nine-tenths, one-tenth being alloy. The British standard of fineness is eleven-twelfths for gold, and thirty-seven-fortieths for silver. Half-dollars, quarter-dollars, and dimes are coined in silver, and a silver half-dime was coined before 1873. This subsidiary silver currency is legal tender for amounts not exceeding five dollars. The gold coins of the U. S. are legal tender for all sums. They are double-eagles, eagles, half-eagles, and quarter-eagles, valued respectively at twenty, ten, five, and two and a half dollars; and there are also one-dollar pieces. In Canada the unit of account is also the dollar, though no dollars are coined. The German thaler has different values. The most current, that of Prussia, is worth seventy-five cents. For the relative value of the world's coins, see Coinage. See also Rixdollar, Silver Coinage, and Money.

Revised by F. M. Colby.

Dollar-bird: a bird (the *Eurystomus pacificus*) belonging to the family *Coraciidæ* popularly known as rollers. It is found in Australia, and is called dollar-bird by the colonists on account of a conspicuous, rounded, white mark on the open wing. Like all the rollers the dollar-bird is brightly colored, being marked with blue, brown, and green. F. A. Lucas.

Dol'lart, The: a gulf of the German Ocean; at the mouth of the river Ems, between Hanover and Holland. It is 8 miles long and 7 miles wide, and was formed by inundations (1277–1362).

Döl'linger, Johann Joseph Ignaz: German divine and leader of the Old Catholic movement; b. at Bamberg, in Bavaria, Feb. 28, 1799. He received priestly orders in 1822, and almost immediately after became chaplain in the dioeese of Bamberg. *The Doctrine of the Eucharist during the First Three Centuries* was published by him in 1826, and in that year he became Professor of Church History in the University of Munich. The substance of his lectures there appeared in 1828 in his *Manual of the History of the Church*, and again, more extended, in his *Treatise on the History of the Church* (1838). He turned his attention to politics in 1845, and represented the University of Munich in the Bavarian Parliament. In 1849, when a delegate to the Diet of Frankfort, he voted for the absolute separation of the Church from the state. In 1861 he delivered lectures advocating the abandonment of the temporal power by the holy see. He published *Origins of Christianity* (1833–35); *The Religion of Mohammed* (1838); *The Reformation, its Interior Development and its Effects* (3 vols., 1846–48); *A Sketch of Luther* (1851); *Hippolytus and Callistus, or the Roman Church in the First Half of the Third Century* (1854; Eng. trans., Edinburgh, 1876); *The Gentile and the Jew in the Courts of the Temple of Christ* (1857; Eng. trans., 2 vols., 1862); *The First Age of Christianity* (1860; 2d ed., 1868; Eng. trans., 2 vols. 1866); *The Church and the Churches, or the Papacy and the Temporal Power* (1861; Eng. trans. 1862); *Papal Legends of the Middle Ages* (1863; n. e. by J. Friedrich, Stuttgart, 1890); *Essay on the Prophetic Spirit and the Prophecies of the Christian Era* (Eng. trans., New York, 1872). Dr. Döllinger in particular obtained wide fame by his opposition to the decrees of the Vatican Council, and particularly to that one declaring the infallibility of the pope when addressing the Church *ex cathedrâ* on questions of faith and morals. He published on this subject the pamphlets *A Few Words on the Infallibility Address* and *The New By-laws of the Council* (1870), and he was, with Profs. Huber and Friedrich, author of *The Pope and the Council* by Janus (1869; Eng. trans., London and New York, 1869), one of the most important works published against papal infallibility, and with Huber *Letters from Rome on the Council* by Quirinus (Eng. trans. 1870). As he emphatically declined to submit to the decrees of the Vatican Council, he was, on Apr. 17, 1871, formally excommunicated by the Archbishop of Munich. On July 29, 1871, he was elected rector of the University of Munich, receiving 54 out of 63 votes cast. He took a leading part in the Old Catholic congresses of Munich (1871) and Cologne (1872). In the former he showed himself opposed to the measures adopted by the majority for effecting a permanent ecclesiastical organization of the Old Catholics; in the latter he was elected chairman of a special committee on the reunion of the Christian churches, a subject to which he devoted a special attention. He was for years a member of the first chamber of the Bavarian Diet. D. in Munich, Jan. 10, 1890. In 1872, in the interest of a union of Greek, Anglican, and Old Catholic Churches, he published *Lectures on the Reunion of the Churches* (1872), and participated in the Bonn conferences of 1874 and 1875. His last publications included *Collection of Documents for the History of the Council of Trent* (1876); *The Autobiography of Cardinal Bellarmin* (1887); *History of the Ethical Controversies in the Roman Catholic Church since the Sixteenth Century, with Contributions to the History and Characteristics of the Jesuits* (1889); *Contributions to the History of the Sects of the Middle Age* (1890, 2 vols.). See Louise von Kobell's *Conversations of Dr. Döllinger* (London, 1892), and his *Life* by E. Michael (Innsbruck, 1892).

Revised by Samuel Macauley Jackson.

Dol'lond, John, F. R. S.: optician; b. in London, England, June 10, 1706; was a silk-weaver in his youth, and employed his leisure hours in the study of sciences and languages. In 1752 he became a partner of his son Peter (b. 1730; d. July 2, 1820) in the business of optician. They made telescopes of superior quality. John Dollond invented the achromatic telescope, for which he received the

Copley medal of the Royal Society in 1758. D. in London, Sept. 30, 1761.

Dolly Varden: common name of a trout, the large charr (*Salvelinus malma*); found in all the clear, cold rivers of the Pacific-coast region from about Mt. Shasta northward to Kamtchatka. The species is similar to the brook trout of the Eastern U. S. (*Salvelinus fontinalis*), from which it is best distinguished by the fact that the red spots which are characteristic of all the group of charrs are found on the back of the fish as well as the sides, while the olive-colored marblings which are found on the Eastern fish are wanting. It is a gamy fish, and sometimes reaches a weight of 12 lb. Besides Dolly Varden, which Prof. Baird, U. S. fish commissioner, chose to retain as the permanent popular name when the fish was sent him for examination, this trout is called in Oregon bull trout, and by the Russians farther north malma or golet. DAVID S. JORDAN.

Dol'men [a word of Keltic origin, meaning table-rock; cf. Breton. *dol*, table, and Welsh *maen*, rock]: in archæology, the framework of a chambered cairn, consisting of two or more unhewn stones placed erect in the ground supporting a large stone which serves as a roof. Formerly in England such a structure was called a CROMLECH (*q. v.*). Kits Coity House, near Aylesford, in Kent, England, is a dolmen composed of four large blocks. In France, where dolmens are very numerous, the term is applied to the whole construction of the cairn, including the covering of earth and stones. See CAIRN.

Dolomieu, dō'lō'mi-ö', DÉODAT GUI SYLVAIN TANCRÈDE GRATET, de: mineralogist; b. at Dolomieu, in Dauphiny, France, June 24, 1750. He joined the order of the Knights of Malta in his youth, and having returned to France in 1791 made a study of the geology of that country, and wrote several treatises, which were inserted in the *Journal de Physique*. He was one of the savants who accompanied Bonaparte to Egypt in 1798; was thrown into a prison by the Neapolitans in 1799, and released the following year; became Professor of Mineralogy in the Museum of Natural History. D. Nov. 26, 1801. See Lacépède, *Notice historique sur la Vie de Dolomieu* (1802).

Dolomite (named in honor of the savant Dolomieu): a mineral, called also *magnesian limestone*, consisting of carbonate of lime and carbonate of magnesia in variable proportions, which are sometimes nearly equal. Its crystals are usually rhomboidal. Dolomite is extensively used as a building-stone, and is converted into good lime by burning. It is abundant in all parts of the world. A cleavable variety is called bitter spar. See LIMESTONE.

Dolo'res Hidal'go, formerly **Dolores**: a city of Mexico; in the northern part of the state of Guanajuato, near the Rio de la Laja (see map of Mexico, ref. 6–G). It is in the *tierra fria*, or cold lands; the hills of the vicinity contain numerous silver mines, now mostly abandoned, and other minerals occur. Dolores was founded as a mission village late in the sixteenth century. It is noted as the birthplace of Mexican independence. On Sept. 16, 1810, the curate, Miguel Hidalgo y Costilla, and others gave the signal of revolt against the Spaniards, called the *Grito de Dolores*. Pop. (1889) 7,220. HERBERT H. SMITH.

Dolph, J. H.: animal and genre painter; b. at Fort Ann, N. Y., Apr. 18, 1835; pupil of Louis van Kuyck, Antwerp, and studied in Paris 1880–82: associate National Academy, N. Y. His pictures of cats and kittens are popular and well known to collectors. Studio in New York. W. A. C.

Dolph, JOSEPH NORTON: politician; b. at Dolphsburg, N. Y., Oct. 19, 1835; educated in the common schools and in Genesee Wesleyan Seminary, Lima, N. Y.; studied law at Havana, N. Y.; admitted to the bar 1861; orderly sergeant in Crawford's Company, raised for protecting emigrants to the Pacific coast against hostile Indians, 1862; settled in Portland, Ore., Oct., 1862; member of Oregon State Senate in 1866, 1868, 1872, and 1874; of U. S. Senate (Republican) 1883–95. D. in Portland, Ore., Mar. 10, 1897. C. H. T.

Dolphin [O. Fr. *dolphin* (> Mod. Fr. *dauphin*) < Lat. *delphi'nus*, from Gr. δελφίς, -ῖνος, dolphin]: a cetaceous mammal of the Atlantic Ocean (*Delphinus delphis*); the dolphin of the classic poets. It is 6 or 8 feet in length, and very active in its habits. There are many similar species known as dolphins in various parts of the ocean. The dolphin or *Dorado* of modern sailors, the beauty of whose colors when dying is so celebrated, is a true fish, the *Coryphæna hippurus*, abounding in the warmer parts of the Atlantic, where it wages incessant warfare against the flying fish and other inhabitants of the sea. It is often eaten, although the flesh is rather dry and said to be sometimes poisonous. The change of color in the dying dolphin consists merely in the fading of the beautiful golden green of life to the dull leaden hue of death, a change which takes place very quickly, the paling being occasionally interrupted by a flush or momentary increase of color. This phenomenon is seen in most brightly colored fishes, and in the case of the dolphin it has become considerably exaggerated by the repetition of the story. It is due to the withdrawal of blood from the pigment cells, or chromatophores, the temporary access of color being produced by a temporary increase of circulation caused by muscular effort. See DELPHINIDÆ.

Dom, or **Don** [Span. < Lat. *domine*, vocat. of *dominus* > Span. *dueño*: Ital. *donno*; O. Fr. *dans*, whence Mid. Eng. *Dan*, as used e. g. by Chaucer]: a title originally assumed in the Middle Ages by the popes. It was afterward borne by bishops, and sometimes given to monks, as Dom Calmet and Dom Mabillon. In Portugal the title *dom* is confined to the king and his family. The Spanish *don* was formerly a title confined to noblemen, but is given by courtesy as indiscriminately as the English *Mr.* In the U. S., Roman Catholic dignitaries of German origin have the title *dom*.

Domain [Fr. *domaine*: Ital., Span. *dominio* > Lat. *domi'nium*, sovereignty, dominion]: empire, authority; the territory over which authority is exercised; landed estate; an estate which a person has in his own right; that portion of the territorial possessions of a lord which he retains in his own occupation, sometimes called DEMESNE (*q. v.*). The term *domaine* is applied in France to public property in general. The public land belonging to the Government or people of the U. S. is often called the public or national domain.

Domain, Eminent: See EMINENT DOMAIN.

Domas y Valle, dō'maäs-ĕĕ-vaal'yā, JOSÉ: Spanish naval officer; b. at Cartagena about 1717. He entered the navy in 1737, and in 1743 had attained the rank of chief of squadron, taking part in many actions on the coasts of Spain Italy, and at Oran. Subsequently he commanded fleets in the West Indies during the war with England 1778–1780, distinguishing himself by safely convoying the treasure ships from Vera Cruz to Havana, despite the English fleet of Rodney which lay in the way. He took part in the capture of Pensacola in 1781, and the siege of Gibraltar in 1784. From 1786 to 1794 he was governor of Panama, and from 1794 to July, 1801, captain-general of Guatemala. D. at Guatemala city, Oct. 9, 1803. HERBERT H. SMITH.

Domat, dō'maa', JEAN: jurist; b. at Clermont, in Auvergne, France, Nov. 30, 1625. He was a friend of Pascal and other recluses of Port Royal. He officiated for many years as king's advocate at Clermont, and published an important systematic work entitled *The Civil Laws in their Natural Order* (1689), for which he received from Louis XIV. a pension of 2,000 livres. It is one of the most important of French legal writings. His selection from Justinian's laws was posthumously published under the title *Legum Delectus*, and subsequently appended to his former work. D. in Paris, Mar. 14, 1696. See E. Cauchy, *Études sur Domat* (1852).

Dombrowski, dom-brovs'kĕĕ, JOHN HENRY: soldier; b. in the palatinate of Cracow, Aug. 29, 1755. He fought against Russia in 1792, under Poniatowski, and again in 1794 when Kosciusko raised the standard of national independence. In 1796 he entered the French service, and having been authorized to organize and command a Polish legion in Italy, he passed into the service of the Cisalpine republic, 1797. In 1806 he raised an army of 30,000 Poles to fight for Napoleon, and distinguished himself at the siege of Dantzic and at the battle of Friedland, in which he was wounded. He gained a victory at Dirschau in 1809, and took part in the Russian campaign of 1812. D. June 6, 1818.

Dombrowsky, JAROSLAV: soldier; b. at Cracow in 1826; served first in the Russian army, and was in 1862 compelled to flee in consequence of having participated in the Polish insurrection. He is also accused of having been a counterfeiter and a traitor to the Poles. He formed a Polish legion in the beginning of the Franco-German war, was on Apr. 8, 1871, appointed to the command of the insurgent troops at Asnières, and on May 9 succeeded Rossel as commander-in-chief of all the forces of the Paris Commune. D. May 23, 1871, having been mortally wounded the day before.

Dome [O. Fr. *dome*, town-house, cupola > Mod. Fr. *dôme*, cupola : Ital. *duomo*, cathedral < Lat. *domus*, house, in sense "house" displaced in Romance languages by *casa* and *man'sio*]: a hemispherical or nearly hemispherical vault or roof rising above the rest of a building, as in many Italian churches. It may be either circular or polygonal in plan, and its section may be semicircular, semi-elliptical, or like a pointed arch. The Romans were the first to erect large domes, and that of the Pantheon at Rome, 140 feet in diameter (probably dating from the time of Trajan), has never been surpassed. Domes were also used on some of their circular temples, and over the circular halls of their thermæ. The Byzantines first applied the dome to ecclesiastical structures, and made it a distinctive feature of their architecture. The dome of Santa Sofia at Constantinople (538 A. D.) is the earliest known example of a dome supported on four arches by means of *pendentives*. (See PENDENTIVES.) Rarely used in the Middle Ages, except in the Byzantine empire, the dome became a favorite feature of Renaissance church architecture (Duomo at Florence; St. Peter's at Rome; St. Paul's, London). Other modern domes are those of the Invalides and Panthéon at Paris, and of the Capitol at Washington, the most important in America. In many cases the dome seen outwardly is a mere shell, supported by the inner dome, or by the walls; thus in that of St. Paul's, in London, a cone of brick built around the inner dome and a complicated timber construction support the outer shell with its lantern. Domes are frequent in the Mohammedan architecture of Turkey and India. See CUPOLA.

Revised by A. D. F. HAMLIN.

Dome-book, Doom-book, or **Dom-boc** (in Lat. *Liber Judicialis*): a code of laws compiled by King Alfred, and ratified by the witan (wise men), gathered from the Kentish collection of Ethelbert, the Mercian laws of Offa, and the laws made by his own ancestor, Ina. The original text is said to have been extant in the reign of Edward IV., but is now lost. Alfred made few original laws, but collected what seemed to him to be good of those already existing. The code begins with an introduction reciting the Mosaic laws (including the Ten Commandments) and passages from the New Testament. It is marked by an evident zeal for justice, and shows a growth of the country in civilization; most were offenses punishable by fines. The laws of England, up to the time of the Norman conquest, were administered in the vernacular speech of the people.

Revised by F. STURGES ALLEN.

Domenichino, dō-men-ĕē-chee'nō (*Domenico Zampieri*): painter; b. at Bologna, Italy, Oct. 21, 1581; a pupil of the Caracci and of Denis Calvaert; painted sacred subjects, of which the *Communion of St. Jerome*, at the Vatican, is considered his masterpiece. His work is powerful in handling, but purely academic and devoid of any form of inspiration or refinement. His reputation and that of his masterpiece belong to a time when the standard of taste was purely artificial and rested on the most superficial qualities of art. D. in Naples, Apr. 15, 1641. W. J. STILLMAN.

Domesday Book, or **Doomsday Book**, or frequently simply **Domesday** [so called because it is a final authority in certain matters]: an ancient record of England containing a survey and statistical account of the state of that country, made by direction of William the Conqueror, and finished in the year 1086. Several of the northern counties were not included in this account. This work is very comprehensive and minute, and forms the basis of all historical accounts of those times. The principal matters of which it treats are the classes of persons in the realm, the different descriptions of land (arable, wood, meadow, etc.), the denominations of money, the territorial jurisdictions and franchises, varieties of tenures, ecclesiastical matters, historical and other particular events, and a few illustrations of ancient manners. By means of it the king acquired an exact knowledge of the possessions of the crown, and ascertained the number of the landholders, the military strength of the country, and the best sources of an increase of revenue. To the people the *Domesday Book* furnished a record by which might be tried questions as to whether land was held by ancient demesne or not. The original *Domesday Book* is preserved among the records in the exchequer at Westminster, and consists of two volumes, one a large folio (called the "great" *Domesday*), and the other a quarto (called the "little" *Domesday*). It was the first great English record to be published at the cost of the nation, and appeared in two folios, printed with type cast for the purpose. It was ten years passing through the press, being completed in 1783; and later supplementary records have since been published, including *A General Introduction to Domesday Book*, by Sir Henry Ellis (1833). Several other English records are known as *Domesdays*, such as the registers of the visitations and inquisitions made by the dean and chapter of St. Paul's, London (1181–1222), which were published in 1857 by the Camden Society.

Revised by F. STURGES ALLEN.

Domestic Animals: such animals as are reared by man for his own use, and at the same time tamed and familiarized to some extent with man's presence; but the mere taming of an individual member of a species is not enough to insure true domestication, which implies a course of breeding for many generations. The more important domestic animals are the ox, buffalo, yak, sheep, goat, reindeer, camel, llama, alpaca (ruminants), the horse, ass, elephant, swine (pachyderms), rabbit, guinea-pig (rodents), dog, cat, ferret (carnivora), and of birds, the hen, turkey, peacock, guinea-fowl, pheasant (gallinaceous birds), goose, duck, etc. (natatores), besides the pigeons and various songbirds. The breeding of fishes for food is not true domestication. The wonderful changes of form, habit, and temper observed in various breeds of the dog, and the still more remarkable variations in the form of pigeons, are adduced by many naturalists to prove the mutability of species. For a discussion of the question in this aspect, see Darwin, *The Variation of Plants and Animals under Domestication* (1867); also DARWINISM and EVOLUTION.

Domett, ALFRED: poet; b. in Surrey, England, May 20, 1811; educated at St. John's College, Cambridge; traveled in America for two years, and on his return, about 1836–37, contributed a number of poems to *Blackwood's Magazine*. After two more years of travel on the Continent he was called to the bar (1841), but in the following year emigrated to New Zealand, where he was among the first settlers. He held important offices in the colonial government, and for his services was created C. M. G. Retiring from public life in 1871 he returned to England and devoted himself to literature. He is thought to be the original of Browning's poem of *Waring*. The best known of his poetical writings are *Ranolf and Amohia, a South-Sea Day Dream* (1872); *Flotsam and Jetsam, Rhymes Old and New* (1877); *Venice* (1839). In prose he wrote a *Narrative of the Wairau Massacre* (1843) and some works on the laws and politics of New Zealand. D. Nov. 2, 1887.

Domeyko, IGNATIUS: scientist; b. at Niedzviadka, government of Minsk, Lithuania, July 31, 1802. He studied at the University of Wilna. Involved in the Polish revolt of 1830, he was compelled to leave the country, finally taking refuge in Paris, where he continued his scientific studies in the School of Mines. Subsequently he was engaged in mining work in Alsatia until 1838, when he accepted employment with the Government of Chili. His services to that country can hardly be overestimated; besides being the acknowledged leader of scientific research, his influence in introducing advanced methods of mining and in developing the riches of Chili was very great. He founded a school of chemistry and mineralogy at Coquimbo; was Professor of Mineralogy and Geology in the University of Santiago from 1839, held various other offices in that institution, and became rector in 1867. Among his published works are *La Araucania y Sus Habitantes* (Santago, 1845), the result of a journey which he made to the country of the Araucanian Indians; a volume of travels in Chili, in the Polish language; and a great number of papers and pamphlets on geology, mineralogy, meteorology, etc. D. in Santiago, Jan. 23, 1889. HERBERT H. SMITH.

Domicile [from Lat. *domicilium*, abode, deriv. of *domus*, house]: a mansion; a place of permanent residence; in law, the place where a person has his home or his legal place of abode.

A distinction must be taken between residence and domicile. A person may have two or more residences, but can have only one domicile. A domicile may be said to be the place where a person has his true fixed and permanent home and principal establishment, and to which, whenever he is absent, he has the intention of returning. A domicile may be acquired in three ways—by birth, by choice, or by operation of law. Domicile acquired in the first mode is frequently called "domicile of origin." When of choice, it must consist both of an act and an intent. A mere intent to acquire a domicile will have no effect. Nor will a

prolonged residence in a particular place constitute a domicile, unless accompanied by an intent to acquire it. Domicile is acquired by operation of law when it is a consequence of certain legal relations, as in the instance of a wife. The rules affecting domicile have much importance in international law, whether public or private, and for this purpose it may be distinguished into domestic and national. Questions concerning the validity of marriages and divorces, the execution and construction of wills, and succession to estates, frequently depend on the law of domicile.

The leading rules governing domicile are these: 1. The domicile of origin continues until a new one is acquired. The same rule of continuance applies to successive domiciles. 2. A person having legal capacity may, in general, change his domicile at will. Persons under legal disability, such as minors and lunatics, have no such power. The domicile of a minor is in general that of his parents or guardian. 3. The law in some cases fixes the domicile of a person at the place where the person is under a duty to reside. Under this rule the holder of an office may be domiciled at a place where official duty requires him to reside. On the same principle the wife's domicile follows that of the husband, though this rule is modified in matters of divorce. 4. To change one's domicile there must be both an intent and an act. The intent may be inferred from a variety of circumstances, and in some instances the inquiry ranges over a period of many years. Under this rule an enforced sojourn in a place will not in general constitute a domicile. See INTERNATIONAL LAW, PRIVATE.

T. W. DWIGHT.

Dominant [from pres. partic. *dominans* of Lat. *domina're*, rule]: in music, the fifth tone of the scale. The dominant is the ruling tone of the key, and next in importance to the first tone of the scale. See CADENCE.

Dominant Tenement: in the law of easements or servitudes, the tenement in favor of which the easement is created. See EASEMENTS.

Domingo, Santo: See SANTO DOMINGO.

Dom'inic (Sp. *Domingo de Guzman*), SAINT: founder of the order of Dominicans; b. at Calahorra, in the diocese of Osma, Old Castile, in 1170; d. in the monastery of St. Nicholas, at Bologna, Aug. 6, 1221. He studied theology in the University of Palencia, and was in 1195 made a canon of the chapter of Osma. In that position he distinguished himself by his zeal for the reform of canonical life and by his success as a missionary among the Mohammedans in the neighborhood. In 1204 he was chosen to accompany the Bishop of Osma on a diplomatic errand, and on that occasion he came into contact with the Albigenses of Southern France. The ecclesiastical situation in those regions was rather critical at that moment. The Cistercians, who had been sent to convert the Albigenses, gave up the task in despair and retired. Dominic, supported by a small brotherhood of followers, took it up and began preaching. He was not more successful than the Cistercians, but he was more persistent. Innocent III. proclaimed a crusade against the Albigenses after his legate, Peter of Castelnau, had been murdered, 1208, by a partisan of the Count of Toulouse, who was favorable to them. In 1233 the disciples of Dominic were given charge of the Inquisition instituted to put down the heresy. (See DOMINICANS and INQUISITION.) After the successful close of the crusade, Dominic determined to transform the brotherhood into a monastic order, silence, poverty, fasts, complete abstinence from flesh, linen clothes, and perpetual preaching against heretics being the vows. Innocent III., because the councils of that period discouraged the establishment of new orders, barely allowed it to be founded. His successor, however, Honorius III., was more favorable. He confirmed the order (1216) and gave it great privileges. Monasteries were founded at Metz and Venice, and Dominic himself, having preached during a visit to Rome to the papal household and made a great impression, was appointed *magister sacri palatii*, or court-preacher, to the pope—an office which is still held by a Dominican. Nevertheless, the new order would not grow, and it was not until 1219 that Dominic, being present at a chapter-general held at Assisi by the Franciscans, discovered the highway to success. At the chapter-general held by the Dominicans at Bologna in 1220 they declared for complete or absolute poverty, renouncing the possession of property in any form or shape, and adopting daily begging for the means indispensable to the sustenance of life. That proved the key to the popular sympathy, and when the next chapter-general was held (Bologna, 1221), sixty monasteries were represented, and members were sent to distant places to make preparations for new foundations. Thus Dominic lived to see his undertaking in a fair way to success. Thirteen years after his death he was canonized by Gregory IX. (1234). His *Life* was written by Jordanus, his successor as general of the order (Lacordaire, Paris, 1840, and Caro, Paris, 1853).

Revised by JOHN J. KEANE.

Dominica: a British West Indian island, about midway between Guadeloupe and Martinique; crossed by lat. 15° 15′ N.; 30 miles long by 11 in greatest width; area of about 290 sq. miles (see map of West Indies, ref. 7–M). It is mountainous throughout, and the peaks are the highest in the Lesser Antilles—the Morne Diablotin (5,340 feet) is the culminating point, the Tres Pitones measures 4,660 feet, and there are many lesser mountains. There are no volcanoes which have been active within historical times, but evidences of volcanic action are very apparent. Several hot springs are known, some of them impregnated with sulphurous acid; the largest, called the boiling lake, occupies a hollow which is supposed to be an extinct crater. The coasts, in great part, are sheer precipices, the harbors are mere roadsteads, and the island is one of the poorest and most thinly peopled of the Antilles. The valleys have been utilized for sugar-planting, the chief industry of the island. Latterly cocoa-planting has risen in importance. Dominica is one of the "Leeward Islands" colony, the central government being at Antigua. The local government consists of an administrator, an executive council, and a legislative council of seven nominated and seven elected members. The island was named by Columbus in allusion to his discovery of it on Sunday (Domingo), Nov. 3, 1493. It was then, and for a long time after, inhabited only by Carib Indians. It was first settled by the French early in the seventeenth century, taken by the English 1759, retaken by the French 1778, and restored to the English by the peace of 1783. A few descendants of the ancient Caribs still live on the island, occupying a small reservation. Pop. (1892) 29,500. Capital, principal town, and port, Roseau, or Charlottetown. See Ober, *Camps in the Caribbees* (1886); Coke, *History of the West Indies* (vol. ii., 1810).

HERBERT H. SMITH.

Domin'ical Letter [*dominical* is from Lat. *domi'nica*, Sunday (for *dominica dies*, Lord's day) > Ital. *domenica*: Fr. *dimanche*; Span. *domingo* < *dominicus* (*dies*)]: in calendars, the letter used to denote Sunday. The Romans used the first eight letters of the alphabet (A to H) to mark the consecutive days of their recurring nundinal period. The early Christians adopted the same plan for marking the days of the week, dropping the last one (H) as unnecessary. In the Church calendar A has always stood for the first day of January, B for the second, and so on. G therefore marks the seventh day, and the cycle begins again with A on the eighth. A returns in like manner on the 15th, the 22d, and so on. Each day in the year has thus its calendar letter, and the letter which falls on Sunday is called the *dominical letter* of the year. Feb. 28 has always the letter C, and Mar. 1 has always the letter D. Feb. 29 in leap-year has therefore no letter provided for it, and this makes a change in the Sunday letter after February, so that in leap-year there are two dominical letters. As the common year contains fifty-two weeks and one day, the dominical letter changes from year to year, going backward one place for every common year and two places every leap-year. This mode of representing the days of the week has been uninterruptedly employed in the calendar of the Church throughout the world from the earliest ages of Christianity.

Dominican Republic (Sp. *República Dominicana*): a country occupying the eastern and larger part of the island of Santo Domingo, in the West Indies. Area calculated at 18,045 sq. miles. The boundary with Haiti is uncertain and liable to change. For physical features and early history, see SANTO DOMINGO.

Population.—Officially estimated in 1888 at 610,000, which is probably too high. The events which led to the establishment of a French colony in the western part of the island did not greatly affect the eastern portion. It long remained under the rule of Spain, and the Spanish language and customs were preserved. Comparatively few African slaves were introduced. Hence the richer and more influential class in the Dominican Republic is largely composed of descendants of Spaniards, more or less mixed with Indian, and, to some extent, with Negro blood. The mass of the

population is a mixed race, with white, Indian, and African blood in about equal proportions, and there are comparatively few pure blacks. Slavery was abolished in 1795. Spanish is the common language everywhere, though French and English are also used in the coast towns. The chief cities are Santo Domingo, the capital, with 14,150 inhabitants; Puerto Plata, the principal port, with 15,000; Santiago, 8,000; La Vega, 10,000; and Samaná, 2,000.

Government.—Theoretically a constitutional republic. The president and vice-president are now chosen for four years by universal suffrage, and are eligible for immediate reelection. The president is assisted by a cabinet of five ministers. Congress consists of a single house of twenty-two members—two from each province and maritime district. They are elected by popular vote, the suffrage in this case being restricted. The six provinces and five maritime districts are administered by governors appointed by the president. The highest judicial power lies in a supreme court. The state religion is the Roman Catholic, but other cults are permitted, with certain restrictions. The mass of the population is still very ignorant, though considerable improvements have been made in public instruction. Primary education is now free and obligatory, at least in theory. There are over 300 municipal schools for primary instruction, with about 10,000 pupils, superior, technical, and normal schools, and a professional school having the features of a university. The republic supports about forty newspapers, mostly very small sheets, and a number of small libraries, museums, etc.

Finances.—The total foreign and internal debt, including unpaid interest, was, on Jan. 1, 1899, about £8,000,000. The revenue and expenditure in 1899 was about £680,000. The revenue is derived chiefly from customs duties levied on both imports and exports, and in many cases are so heavy as to be practically prohibitory. On July 1, 1897, the U. S. gold dollar was adopted as the standard of value, but only a debased silver coinage and depreciated paper money are in circulation. By an arrangement made early in 1893, the American Santo Domingo Improvement Company assumed control of the custom-house on Mar. 1 of that year, agreeing to pay from the receipts the interest on $6,500,000 of the foreign debt, to provide $90,000 per month for the budget, and to finish, in conjunction with the government, the railroad from Puerto Plata to Santiago. The company claims that by careful management the customs receipts may be largely increased.

Industries and Commerce.—Agriculture, grazing, and forestry are almost the only industries. It is stated that five-sixths of the land is fit for cultivation, but only a small portion is utilized, and that in a very primitive and slovenly manner. The chief agricultural products are tobacco, coffee, cacao, sugar, a little cotton, and maize, beans, and manioc for home consumption. Large herds are kept on the open lands, running almost wild. They are used only for their hides and meat. Logwood, lignum-vitæ, satinwood, mahogany, and fustic are obtained in the forests. The exports in 1898 were valued at $5,789,997, the principal items being tobacco, coffee, sugar, hides, and cabinet woods. The imports for the same year were officially stated at $1,696,280. More than half the trade is with the U. S. The circulating medium consists mainly of silver coins from Spain, Mexico, the U. S., France, and England. The French metrical system of measurements is legal, and is coming into general use. A railroad has been completed from Samaná to La Vega, 72 miles, and is being carried on to Santiago; another, from Puerto Plata to Santiago, 45 miles, was opened in Aug., 1897. There are 430 miles of telegraph, and the island is connected with Europe by the cable of the French Submarine Telegraph Company.

History.—The revolt of the Negroes and mulattoes in the French part of the island, 1791–97, did not extend to the eastern districts, which remained faithful to Spain. But in 1795 Spain, by treaty, transferred the whole island to France, and French troops occupied Santo Domingo city. They were driven out by Toussaint Louverture Jan. 2, 1801, and for a time the whole island was an independent country under his rule. In 1802 it was again occupied by the French, and, though they were soon driven from the western part, they remained masters of the east until 1809, when Santo Domingo and Samaná were taken by the English and turned over to Spain. The Spanish rulers, by their tyranny and weakness, provoked a revolt. Boyer, president of Haiti, aided by the rebels, occupied Santo Domingo in 1822, and the whole island was again united in the republic of Haiti. The deposition of Boyer in 1843 was followed by a revolution in the east, and on Feb. 27, 1844, the entire eastern or Spanish-speaking portion of the island formally separated from Haiti, taking the name Dominican Republic. In the war for independence which followed Gen. Pedro Santana was the principal leader of the Dominicans, and the Haitians being defeated he was elected first president. He resigned in 1848. His successor, Zimenes, was a weak man, and is said to have invited an invasion of the Haitian leader, Soulouque; but the country flew to arms under the old leader, Santana, and Soulouque was defeated at Ocoa, Apr. 21, 1849. Zimenes was then deposed and Buenaventura Baez was elected president. He was succeeded in 1853 by Santana, who exiled Baez, and in 1856 again defeated the Haitians under Soulouque; but he became unpopular and was obliged to retire, and in 1857 Baez was recalled from exile and again made president. A revolution in 1858 drove Baez out and again made Santana president. Unable to maintain peace, Santana betrayed the country by ceding it to Spain under certain conditions (May, 1861). The Spaniards, once in possession, ignored the conditions, and though at first the people made no resistance to them, the tyrannical acts of some of their officers eventually provoked revolts. Headed by José Maria Cabral the Dominicans drove the Spanish troops out in 1865 and reaffirmed the constitution of 1844 with certain changes. Baez was again called back and made president. He was deposed by Cabral in 1866, but recalled in Mar., 1868; and on Nov. 29, 1869, he signed with President Grant two treaties, one for the annexation of Santo Domingo to the U. S., and the other for the cession of the bay of Samaná, both subject to the approval of the people. The annexation scheme was ostensibly, at least, approved by the people of Santo Domingo; but the Senate of the U. S. refused to ratify it, and though a U. S. commission which visited the island reported favorably on it, nothing further was accomplished. The failure of this scheme led to another revolution and the banishment of Baez. For several years the republic was in a disordered state. In 1886 Gen. Ulisses Heureux, a young man of mixed race, was elected president, and by a change in the constitution he was allowed to be his own successor. Heureux in 1893 entered on his second term, and the country under his rule has been prosperous and orderly, though affected by business depression.

References.—Francisco Alvarez Leal, *La République Dominicaine* (official, Paris, 1888); Hazard, *Santo Domingo, Past and Present* (1873); Merino, *Elementos de geografía física, política y historica de la República Dominicana* (1889); Garcia, *Compendio de la historia de Santo Domingo* (1879).

Herbert H. Smith.

Domin'icans (also called *Preaching Friars*): an order of mendicant friars founded by St. Dominic at Toulouse; confirmed by Pope Honorius III. in 1216. They were called Black Friars in England and Jacobins in France, from the Rue St. Jacques (Jacobus), where they first established themselves. In 1216 Honorius III. constituted the order under the rules of St. Augustine, which enjoined almost continual fasts, perpetual silence, and other mortifications. In 1221 the order was introduced into England, and their first establishment made at Oxford. In 1276 the corporation of London granted the order two lanes near the Thames, where a monastery was erected, the neighborhood of which is still called Blackfriars.

The secrets of the immense success of the mendicant and predicant orders were simply their cultivation of poverty and asceticism, which made them accepted by the mass of the people as brethren, and their popular, impressive preaching, which made them the spiritual guides of the masses. Their poverty, however, soon gave way to the necessities of other works than preaching. In 1425 Martin V. recalled the prohibition, so far as the Dominicans were concerned, to possess real estate or other property, and donations and bequests immediately began to pour down upon the order; it has erected some of the most magnificent ecclesiastical buildings in Christendom. To its preaching the order afterward added lectures. In 1228 it obtained a chair of theology in the University of Paris, and in 1230 another. At the beginning of the Reformation the Dominicans were the foremost expounders of theological science, and the strenuous upholders of that form of it, the scholastic, of which Thomas Aquinas had been the master builder.

Among the men of genius and eminent scholars belonging to this order were Thomas Aquinas, Albertus Magnus,

Meister Eckart, Johann Tauler, Heinrich Suso, Savonarola, Las Casas, Vincent Ferrier, and Vincent of Beauvais. It has given to the Church more than 800 bishops, 150 archbishops, 60 cardinals, and 4 popes. The reputation of the Dominicans in history, however, is famous for their connection with the Inquisition. It was in 1233, twelve years after the death of their founder, Dominic, that they were appointed inquisitors. Their principal rivals were the Franciscans, and the two orders for a long time divided between them the intellectual control of the Church. The history of theology, philosophy, and science was for a couple of centuries wholly taken up by the rivalry of the Dominicans and the Franciscans. All mental exertions were absorbed by the controversy between the Thomists and the Scotists. The Jesuits in the sixteenth century gradually took possession of the intellectual supremacy formerly exercised by the Dominicans. Dominican monks and nuns are, however, still found in most countries.

After the discovery of America the order took a prominent part in the evangelizing of Mexico, Peru, New Granada, the islands of the Mexican gulf, Florida, and New Mexico. Las Casas, the champion of the Indians against the cruelty of the Spanish colonists, was a Dominican. They were introduced into California under the Spanish domination. Their first foundation in the U. S. was made in Springfield, Ky., in 1807. Revised by JOHN J. KEANE.

Dominion of Canada: See CANADA, DOMINION OF.

Dom'inis, MARCO ANTONIO, de: an Italian theologian; b. in the isle of Arba, near Dalmatia, in 1566. He became a Jesuit at Padua 1579, and professor of philosophy, and wrote a curious treatise on light, entitled *De Radiis Visus et Lucis in Vitris Perspectivis et Iride* (1611), in which the phenomena of the rainbow were explained for the first time. In 1596 he left the Jesuits, became Bishop of Segni, and in 1598 Archbishop of Spalatro and Primate of Dalmatia. He got out of sympathy with the Roman Church, in consequence fell under the suspicion of the Holy Inquisition, and to escape trial fled to England, professed Protestantism 1616, and was made Dean of Windsor 1617. He wrote *De Republicâ Ecclesiasticâ* (On the Ecclesiastical Republic, 1617) and other treatises against Rome; but he did not feel at home in his new surroundings. His old friends pleaded with him to return, especially Cardinal Ludovici, who had become Pope Gregory XV., and so in 1622 he returned to Italy and the Roman Catholic Church. He gave his reasons, *M. A. de D. sui Reditus ex Anglia consilium exponit* (Rome, 1623; Eng. trans., *My Motives for Renouncing the Protestant Religion*, n. e. London, 1827). Shortly after Pope Gregory died (1623). He then was accused of heresy before the Inquisition, thrown into prison, and ere his trial was finished he died, Sept., 1624. On Dec. 21, 1624, sentence was pronounced; his body was dragged through the streets of Rome, burned by the hangman, and its ashes thrown into the Tiber. SAMUEL MACAULEY JACKSON.

Domin'ium [Lat. sovereignty, deriv. of *do'minus*, master]: in Roman law, full legal right in and to an object, but which could not be conferred by actual possession alone unless such possession had endured for the period of legal prescription.

Domi'tian, or, more fully, **Ti'tus Fla'vius Domitia'nus**: a Roman emperor; b. Oct. 24, 52 A. D.; the second son of Vespasian. He succeeded his brother Titus in the year 81, and began his reign with moderation and apparent respect for justice. In the year 87 he was unsuccessful against the Marcomanni, and soon afterward was defeated by the Dacians, who compelled him to pay tribute; but in spite of his reverses he celebrated a triumph, and assumed the victorious titles of Germanicus and Dacicus. After 93 A. D. he became extremely cruel and suspicious, persecuted the Christians, and caused many innocent persons to be put to death. He banished a number of eminent men and philosophers, including Epictetus. Through the emperor's jealousy the great general Agricola was recalled from Britain. Domitian was assassinated by conspirators in his palace in 96 A. D., and was succeeded by Nerva. See Suetonius, *Domitianus*.

Don: a title. See DOM.

Don (anc. *Tanais*): a river of Russia; rises in the government of Tula, and flows in a general southeasterly direction to Kachalinsk. Below the town it runs nearly southwestward, and enters the northeastern part of the Sea of Azof, near the town of Azof. Its total length is about 1,125 miles. Its navigation is difficult during low water, but when the water is high (i. e. in April and May) vessels can ascend about 600 miles from its mouth. The Don in its upper course is connected by canal and railway with the Volga. In its lower course it is subject to two floods, called respectively the cold water and the warm water, of which the former is caused by the melting of the snow in the country of the Don Cossacks, and the latter by the melting of the snow in the regions of its upper course. When flooded it presents a very lively aspect, a great number of steamboats traversing its waters from its mouth to Kachalinsk, on the Wolga railway. But when the flood subsides, in June or July, navigation almost ceases. The river is generally closed by ice from November or December to March or April, and in rare cases the freezing has taken place in October. At Aksai it remains open 250 days in the year, but at the influx of the Medvieditza only 239.

Don, COUNTRY OF THE: a province of Southeastern Russia; on the lower Don river, N. E. of the Sea of Azof. Area, 61,886 sq. miles. Pop. (1897) 2,575,818. It is a low, level plain, a part of the southern steppe of Russia, alkaline and monotonous in the E., but somewhat diversified in the W., abounding in marshes and lakes, some of them saline. Forests occupy only 2 per cent. of the surface, and the soil is such that it is generally incapable of forestation. The country is devoted to the rearing of cattle, but the vine thrives along the right bank of the Don, though the wine is poor. Fish form an important resource of the province, and considerable salt is produced. The country is well provided with railways. The people are mostly Cossacks. Capital, Taganrog. M. W. H.

Don: a river of Scotland, in Aberdeenshire; rises in Ben Aven, and enters the North Sea a mile from Old Aberdeen. Its general direction is eastward, and its length, including windings, 78 miles. Nearly a mile from its mouth it is crossed by the "Brig o' Balgownie."

Donaldson, EDWARD: rear-admiral U. S. navy; b. in Baltimore, Md., Nov. 17, 1816; entered the navy as a midshipman July 21, 1835. He commanded the steam-gunboat Scioto at the passage of Forts Jackson and St. Philip and capture of New Orleans April 24, 1862, and at the passage of the Vicksburg batteries June 28, 1862; and the steamer Seminole at the battle of Mobile Bay. D. May 15, 1889.

Donaldson, JAMES: educator and author; b. at Aberdeen, Scotland, Apr. 26, 1831; appointed Greek tutor in Edinburgh University 1852; rector of the High School of Stirling 1854; classical master (1856) and rector (1866) of the High School of Edinburgh, and Professor of Humanity 1881. In 1890 he became principal of the University of St. Andrews. Besides many contributions to British periodicals, he has written critical and grammatical works of great value, among which are a *Modern Greek Grammar for the use of Classical Students* (1853); *Lyra Græca: Specimens of the Greek Lyric Poets from Callinus to Soutsos* (1854); *Critical History of Christian Literature and Doctrine from the Death of the Apostles to the Nicene Council* (3 vols., 1864–66). In conjunction with the Rev. Alexander Roberts he edited *The Ante-Nicene Christian Library* (24 vols., 1867–72).

Donaldson, JAMES LOWRY: U. S. military officer; b. Mar. 17, 1814, in Baltimore, Md.; graduated at West Point, 1836; and July 28, 1866, assistant quartermaster-general U. S. army (rank of colonel); served in Florida war 1836–38; in the war with Mexico 1846–48, and in the civil war. He was made brevet colonel and brigadier-general Sept. 17, 1864, for distinguished services in the Atlanta campaign, and major-general U. S. army Mar. 13, 1865, and major-general U. S. volunteers June 20, 1865, for faithful and meritorious services; retired Mar. 15, 1869; resigned Jan. 1, 1874. He was author of *Sergeant Atkins*, a tale of adventures in the Florida war (1871). D. in Baltimore, Nov. 4, 1885.

Donaldson, JOHN WILLIAM, D. D.: philologist and biblical critic; b. in London, England, June 7, 1811; was educated at Trinity College, Cambridge, of which he became a fellow in 1834; wrote the *New Cratylus* (1839); was head master of King Edward's School at Bury St. Edmunds from 1841 till 1855, and thenceforward resided as a tutor at Cambridge. In 1854 he published *Jashar; or, Fragments of Original Hebrew Songs inserted in the Masoretic Text of the Old Testament*. The book was written in Latin; it excited a great clamor and was defended in his *Christian Orthodoxy Reconciled with the Conclusion of Modern Biblical Learning*, 1857. He also published *The Theatre of the Greeks* (1827; 8th ed. 1875), once a standard work, now quite an-

tiquated; *The History of the Literature of Ancient Greece* (1858, 3 vols., the first two being a translation from the German of O. Müller), etc., and grammars of Hebrew, Greek, and Latin. D. in London, Feb. 10, 1861.

Revised by A. Gudeman.

Donaldsonville: town (incorporated in 1813); capital of Ascension parish, La. (for location of parish, see map of Louisiana, ref. 10-E); situated on railway and on Mississippi river, at the origin of Bayou Lafourche, 64 miles above New Orleans; has 6 churches, 2 public schools, 3 parochial schools, ice-factory, 2 saw-mills, 2 brickyards, 2 lumber-yards, electric lights, etc. Pop. (1880), 2,600; (1890) 3,121; (1900) 4,105. Editor of "Chief."

Donatello, dō-naă-tel'lō, Donato di Nicolo di Betti Bardi: sculptor; b. in Florence, Italy, 1386. He carried the true principles of Greek art to the highest perfection that Italian art has ever seen, in some of its finest qualities even beyond Michaelangelo, though with less imagination and less technical power. His ideal of character in the statues of historical, as well as of mythical, personages unknown to art, stands unequaled in art-history; and although he is influenced by the life around him, in the types and forms of his ideal portraiture, in the spirit of the work and the complete ideality of its development he is entitled to rank amongst the first sculptors of all time. His art is purely sculpturesque, like Michaelangelo's, but with more individuality and distinctiveness in its idealization of character. His great work is the colossal equestrian statue of Gattamelata at Padua. Other important works are a bronze statue of David with Goliath's head in the National Museum at Florence; a marble statue of St. John the Baptist in the same museum; a large sculpture in relief of the Annunciation in the Church of Santa Croce; and the statues of St. Peter, St. Mark, and St. George, at the Church of Orsanmichele, all in Florence; the front of the high altar of St. Anthony at Padua, and the bas-reliefs of the out-of-door pulpit of the Cathedral at Prato. Italy is full of his precious works. D. in Florence, Dec. 13, 1466. W. J. Stillman.

Donation: in law, the giving or transferring of property by the owner to another without consideration; a gift. The word is often used in its Latin form in the phrases *donatio inter vivos*, a gift between the living, and when the donor is not in apprehension of death; and *donatio causa mortis*, or gifts in prospect of death. In either case a delivery into the possession of the donee is essential to the completion of the donation. In the case of a *donatio inter vivos* the property vests beyond retraction in the donee upon delivery, unless the donor was under some legal disability, as infancy or lunacy, or unless the donation would work a fraud upon the rights of the creditors of the donor. In the case of a *donatio causa mortis* the property vests in the same way, upon delivery and the contemplated death of the donor. F. Sturges Allen.

Donation of Constantine: a fictitious document by which Constantine is said to have bestowed on Pope Sylvester (*q. v.*) the temporal sovereignty over Italy, in return for a miraculous cure from leprosy through the agency of that pontiff. The transaction, though purely mythical, was believed in for some time and gravely urged by some writers in support of the papal claims to Italian territory.

F. M. Colby.

Donati's (dō-naa'tēēz) **Comet**: a comet discovered in June, 1858, by the Italian astronomer Giambattista Donati (b. in Pisa, Dec. 16, 1826; d. in Florence, Sept. 20, 1873). It continued visible for many months. It was nearest to the earth in October, at which time its tail was over 40° in length and remarkably brilliant. It was carefully observed by Prof. Bond of Cambridge, who published an elaborate and elegantly illustrated memoir on the subject. Mr. G. W. Hill combined all the observations that were made on its position, and as a result assigned to it a period of about 1950 years. Newcomb says that the uncertainty arising from imperfect observations may amount to fifty years.

Don'atists: in ecclesiastical history, a party in the North African Church which effected a schism that lasted from 311 A. D. till the sixth century. They took their name from Donatus the Great, who was their bishop after Majorinus, from 315 to 348. The early history of this deeply interesting movement is obscure and complicated. A powerful exciting cause of the schism was the question as to the mild or severe discipline of Christians who left the faith in times of persecution, the Donatists advocating rigorous measures; but there were numerous other questions involved in the controversy, the most important being that of the union of the whole people within the Church (as maintained by the Catholic party), while Donatus demanded the separation of the Church from the world. Early in his reign Constantine the Great excluded the Donatists from the privileges conferred upon the Church, and in 316 A. D. he issued penal edicts against them. A fierce persecution ensued, lasting till 321, when the emperor granted them liberty of conscience. After his death the penal laws against them were revived, but they defended themselves with much spirit until, in 361 A. D., Julian (the so-called Apostate) restored to them their full freedom. Prosperity followed, and they boasted at one time of having 400 bishops in Africa; but controversies sprang up among them as well as with the Catholic party, until the Emperor Honorius ordered a conference between seven representatives on each side to take place at Carthage in June, 411, under the presidency of Marcellinus, a soldier and under secretary of state. As it came out very plainly from the luminous speech of Augustine that the Catholic representatives had reason and scripture upon their side, the emperor classed the Donatists as heretics (412), and all their clergy were banished (414). Donatism, as well as the African Church in general, was overwhelmed by the Vandal conquest (428 A. D.), yet it survived in a feeble condition for many years.

The Donatists are held by many historians to have erred by excessive fanaticism and a schismatical spirit, while it is generally conceded that the treatment they received from the state Church was severe and injudicious. In doctrine they were essentially orthodox, and the charges of immorality brought against them appear to have been the inventions of their enemies. There were doubtless errors on both sides, but the general position of the Donatist party appears to have been in accord with that now taken by those Protestant churches which demand a personal experience of regeneration, as separating their membership from the world at large. See Augustine's *Writings Connected with the Donatist Controversy*, tr. by J. R. King, in vol. iv. *Nicene and Post-Nicene Fathers*, 1st series, pp. 369–651; F. Ribbeck, *Donatus und Augustinus* (2 vols., Elberfeld, 1857–58); Deutsch, M., *Drei Aktenstücke zur Geschichte des Donatismus* (Berlin, 1875); D. Voelter, *Der Ursprung des Donatismus* (Freiburg, Baden, 1883). Revised by S. M. Jackson.

Donative, or in full **Donative Advowson**: in Great Britain a species of advowson in which the benefice is in the gift or disposal of the patron of the church or chapel, and in which the right of visitation is in the founder, and not in the bishop or ordinary. The donee is vested with the benefice without presentation, institution, or induction, but he must be a priest in holy orders by episcopal ordination.

F. Sturges Allen.

Donato: sculptor. See Donatello.

Dona'tus: Bishop of Casæ Nigræ in Numidia, an early leader in the Donatistic schism; not to be confounded with Donatus the Great, an abler man, who was the second schismatic bishop (Majorinus being the first), as noticed in the article Donatists (*q. v.*).

Donatus, Ælius: Latin grammarian; flourished about 353 A. D.; taught rhetoric at Rome. He was the teacher of St. Jerome, who expressed a high opinion of his talents. He wrote a work on grammar, which was commonly used in the schools of the Middle Ages. This exists in a longer and shorter form. (See Keil's ed. of the *Grammatici Latini*, vol. iv.) The word Donat became synonymous with *grammar* or any kind of elementary lesson. Donatus wrote also a valuable commentary to Vergil's *Æneid* and *Georgics* and to the plays of Terence. An interpolated copy of the latter to all the plays except the *Heautontimorumenos* is preserved. See Klotz ed. of Terence in 2 vols., Leipzig, 1838–40.

Revised by M. Warren.

Donatus, Tiberius Claudius: Latin grammarian of the latter part of the fourth century; much inferior in ability to Ælius Donatus, with whom he is frequently confused. His commentary on the *Æneid* of Vergil is preserved, but has little value. M. W.

Donauwörth, dō'now-vert: a town of Bavaria; on the Danube, at the mouth of the Wernitz, 25 miles N. N. W. of Augsburg (see map of German Empire, ref. 7–E). It was formerly a free town of the empire, but has declined in importance. It has several churches and hospitals. Here Marlborough defeated the Bavarians July 2, 1704, and here

the French general Soult gained a victory over the Austrian general Mack Oct. 6, 1805. Pop. (1890) 3,733.

Do'nax [Gr. δόναξ, reed, name of a fish]: a genus of bivalve mollusks of triangular form, belonging to the *Donacidæ*. There are forty-five living European and tropical species, and thirty fossil ones from the Eocene of Europe and the U. S. *Donax* is also the specific name of a reed or grass (*Arundo donax*) found in the South of Europe, used for fishing-rods and other purposes.

Don Benito, dōn'bā-nee'tō: a town of Spain; province of Badajoz; near the river Guadiana; 69 miles by rail E. of Badajoz (see map of Spain, ref. 17–D). It has manufactures of woolen goods, wine, and oil. Pop. (1887) 16,287.

Don'caster (anc. *Danum*): market-town in the West Riding of Yorkshire, England; on the river Don, 35 miles S. of York (see map of England, ref. 7–I). It is pleasantly situated and well built; has two stone bridges across the Don, a fine parish church, a public library, and a theater, and has manufactures of iron, brass, sacking-linen, locomotives, railway cars, and agricultural machines. There is a large corn market here. The town was burned by lightning in 759 A. D. It is famous for its annual horse-races, for which Col. St. Leger founded the stakes in 1776. Pop. (1891) 25,936.

Donegal': a county in the extreme northwestern part of Ireland, province of Ulster, bounded N. and W. by the Atlantic Ocean. Area, 1,870 sq. miles. The coast-line is 395 miles long, and is deeply indented by many bays and loughs. The surface is mountainous and boggy; about one-third is arable. Granite, Devonian rocks, and carboniferous limestone are found here. This county has some manufactures of linen and worsted hose, and good fisheries of cod, sole, plaice, herring, and mackerel, but it was at one time also the chief seat of illicit distilleries in Ireland. Capital, Lifford. Pop. (1881), 206,035; (1891) 185,211.

Donegal: a seaport of Donegal county, Ireland; on Donegal Bay, at the mouth of the Eske, 11 miles N. N. E. of Ballyshannon (see map of Ireland, ref. 4–F). It has a harbor for vessels which draw 12 feet of water. Corn and butter are exported. Lat. 54° 39′ N., lon. 8° 6′ W. Pop. 1,400.

Donegal, Marquesses of (1791): Earls of Donegal (1647), Earls of Belfast (1791), Viscounts Chichester and Barons Belfast (Ireland, 1625), Barons Fisherwick (Great Britain, 1798), Barons Ennishowen and Carrickfergus (United Kingdom, 1841).—George Hamilton Chichester (b. Feb. 10, 1798), third marquess, K. P., G. C. H., F. R. S., aide-de-camp to the Queen, succeeded his father Oct. 5, 1844. D. in Oct., 1883. He was succeeded by his brother Edward (b. June 11, 1799), who died Jan. 20, 1889, and was succeeded by his son, George Augustus Hamilton Chichester, fifth marquess, b. June 27, 1822.

Don'elson, Andrew Jackson, LL. D.: U. S. military officer and diplomatist; b. Aug. 25, 1800, near Nashville, Tenn.; graduated at West Point in 1820. He served (1821–22) as lieutenant of engineers and as aide-de-camp to his uncle, Maj.-Gen. Jackson, when governor of Florida, just acquired from Spain. He resigned from the army Feb. 1, 1822, studied law and became a cotton-planter near Nashville, Tenn. He was private secretary to President Jackson 1829–30; *chargé d'affaires* to Texas 1844–5, negotiating its annexation to the U. S.; U. S. minister plenipotentiary to Prussia 1846–49; and to the federal government of Germany 1848–49. Soon after his return from Europe he became enlisted in efforts to secure the settlement of the slavery agitation growing out of the acquisition of territory from Mexico. With strong national views he became editor of the Washington *Union* 1851–52, and in 1856 was the candidate of the American party for Vice-President of the U. S. After his defeat he retired altogether from public life, and devoted his time to planting interests in Mississippi. D. at Memphis, Tenn., June 26, 1871.

Donelson, Fort: See Fort Henry and Fort Donelson.

Do'nets: a river of Southern Russia; the chief affluent of the Don; rises in the government of Koorsk. It flows nearly southeastward, and enters the Don 40 miles N. E. of Novo-Tcherkask. Length, about 400 miles.

Dongola, dong'gō-la: town of Nubia, in East Sudan; on the left bank of the Nile (see map of Africa, ref. 3–F). It is generally called **Dongola Makarah**, or New Dongola, in contradistinction to Dongola Angusa, or Old Dongola, a village, half in ruins, situated about 75 miles farther up the river and once a flourishing place, but destroyed by the Mamelukes in 1820. New Dongola grew up around the new military and administrative buildings which were established on the spot in 1820 by the Egyptian government, and it is now a thriving place, with well-furnished bazaars, an indigo-factory belonging to the government, public baths, and a considerable trade. Pop. 10,000.

Donizet'ti, Gaetano: composer; b. at Bergamo, Nov. 29, 1797; received his musical education in his native city and in Bologna; produced his first opera, *Enrico*, at Vienna in 1818; composed about thirty other operas, now forgotten, in the style of Rossini; entered a new stage of development by his *Anna Bolena* (Milan, 1830), partly under the influence of Bellini, partly in rivalry with him; acquired a European fame by his *Lucia di Lammermoor* (Naples, 1835); produced at Paris in 1840 *La Fille du Régiment*, *Polinto*, and *La Favorita*; at Vienna, in 1842, *Linda di Chamouni*; at Paris, in 1843, *Don Pasquale*; was in 1844 stricken with paralysis, and spent his last years for the most part in a lunatic asylum. D. at Bergamo, Apr. 1, 1848.

Donjon, or **Dungeon** [O. Fr. *dongeon*, Mod. Fr. *donjon* < Med. Lat. *dominio*, domain, castle]: the central building, tower, or keep of an ancient castle or fortress of the Middle Ages. It was often erected on a natural or artificial elevation. The lower story of the donjon was used as a prison. See Castle.

Don Juan: a legendary personage; according to Spanish tradition, a profligate nobleman who killed in a duel the father of a lady he had attempted to seduce. The story is localized at Seville, and the hero's name is given in full as Don Juan de Tenorio. In later versions, however, he is confused with one Don Juan de Marana, who sold himself to the devil that he might indulge his unbridled sensuality. The original Don Juan having invited to a feast the statue erected to his victim, he challenged the spirit, whose existence he denies, to manifest itself to him. The spirit thereupon proves its power and condemns him to perdition. This story was dramatized by Tirso de Molina; it also forms the subject of one of Molière's comedies, of Mozart's celebrated opera, *Don Giovanni*, and of Byron's famous poem.

Revised by A. R. Marsh.

Donkey: See Ass.

Donne, John, D. D.: poet; b. in London, England, in 1573; educated at Hart Hall, Oxford; entered Lincoln's Inn, London, 1592. He married Anne More, a niece of Sir George More, of Loxly, lord-lieutenant of the Tower, who was visiting in the house of Sir Thomas Egerton, afterward Lord Chancellor Ellesmere, where he had a position as private secretary. Though Donne had already acquired a reputation as a poet, Sir George absolutely refused to give his consent to the marriage, and when they were, nevertheless, married clandestinely (1600), he disinherited the daughter. Donne afterward became a priest of the Anglican Church (1615), although of Roman Catholic parentage, and not without scruples on that account. But James I. had conceived high ideas of his theological capacity, and would give him no other preferment than in the Church. Having gained distinction as the only eloquent preacher of his time, he was appointed dean of St. Paul's, London, in 1621. He wrote elegies, satires, and other poems, and belonged to the school called "Metaphysical Poets," whose works abound in forced conceits. Some of his early poems are very licentious, but many have great poetic merits. His sermons are justly admired. They are given by H. Alford (6 vols., London, 1839). The first complete edition of his poems was issued in 2 vols. (London, 1872). D. in London, Mar. 31, 1631. See Izaak Walton, *Life of J. Donne* (1640); H. Alford, *Life of Donne* (1839).

Donnelly, Ignatius: politician and writer; b. in Philadelphia, Nov. 3, 1831. After 1856 he resided in Minnesota, which State he several times represented in Congress. As an author he was known chiefly by the eccentric geological theories propounded in *Atlantis* (1882) and *Ragnarok* (1883), and by his claim to have discovered a cryptogram or word-cipher in Shakspeare's plays which transfers their authorship to Francis Bacon. D. Jan. 1, 1901.

Don'ner, Johann Jacob Christian: translator; b. in Crefeld, Germany, Oct. 10, 1799; professor in Stuttgart. He translated Homer, Pindar, Æschylus, Sophocles, Euripedes, Aristophanes, Plautus, Terence, Juvenal, and Persius, in the meters of the originals. D. in Stuttgart, Mar. 28, 1875.

A. G.

Don'ner Lake: a small lake in Nevada co., Cal., near the Central Pacific Railroad; 154 miles from Sacramento; is a place of summer resort. It takes its name from the tragical fate of a party of overland emigrants, led by a man named Donner, who in the winter of 1846 were snow-bound at this point, and nearly all starved to death, those who escaped having survived by eating the flesh of their dead comrades.

Don'nybrook: village of Ireland; county of Dublin; partially incorporated in Dublin (see map of Ireland, ref. 9–I). It has a magdalen asylum, a dispensary, a hospital for incurables, and an asylum for lunatics called the Bloomfield Retreat, established by the Society of Friends. It formerly had a famous annual fair. Pop. 1,800.

Donoho, Gaines Ruger: landscape-painter; b. at Church Hill, Miss., Dec. 21, 1857. Pupil of R. Swain Gifford, New York, and Boulanger and Lefebvre, Paris; diploma of honor, New Orleans Exposition, 1885; second-class medal, Paris Exposition, 1889; member Society of American Artists 1882; Webb prize for landscape, S. A. A., 1892. His work is virile in execution, true to nature, and strong in color. Studio in New York. W. A. C.

Dono'so Cortés, Juan Francisco Maria, Marques de Valdegamas: writer and diplomatist; b. in El Valle, Estremadura, Spain, May 6, 1809. He opposed Don Carlos, and became secretary to Queen Isabella in 1844. In 1848 he was sent as ambassador to Berlin. He was conservative in politics, and defended the Roman Catholic religion in his *Essai sur le Catholicisme, le Libéralisme, et le Socialisme* (Essay on Catholicism, Liberalism, and Socialism, 1851). D. in Paris, May 3, 1853.

Donoso, Justo: Chilian prelate; b. in Santiago, 1800. He was rector of the Seminario Conciliar at Santiago; lecturer on theology in the university; judge of the ecclesiastical court, and one of the founders of the *Revista Católica*, an organ of the Church party. In 1844 he was named Bishop of Aneud, and in 1855 he was translated to the see of La Serena. Bishop Donoso is well known for his works on canonical law, which are authorities throughout South America. D. at La Serena, Feb. 22, 1868. All his property was bequeathed for charitable purposes. H. H. S.

Donoughmore, Earls of, and Viscounts Suirdale (1800), Barons Donoughmore (Ireland, 1783), Viscounts Hutchinson (United Kingdom, 1821).—John Luke George Hely Hutchinson, fifth earl; b. Mar. 2, 1848; succeeded his father Feb. 22, 1866.

Don Quixote de la Mancha, Sp. pron. dōn'kĕe-*kh*ō'tā-de-lăă-maan'chăă: the hero of the celebrated romance in which its author, Miguel Cervantes de Saavedra, satirized the dangerous prejudices of race and blood and the contempt of useful work which prevailed among the larger part of Spanish society at his time, and held up to his countrymen a higher moral ideal. The first part of the famous work of Cervantes was published at Madrid in 1605, the second in 1615; the first complete edition dates from 1637. The best annotated editions are still those of the Spanish Academy (1780 and numerous reprints), of Pellicer (5 vols., Madrid, 1797–99), of Ideler (6 vols., Berlin, 1804), and of Clemencin (6 vols., Madrid, 1833–39). Of translations may be mentioned as especially faithful the German one by Braunfels (4 vols., Stuttgart, 1884), the English one by Ormsby (4 vols., London, 1885), and the French by L. Biart (4 vols., Paris, 1878). Henry R. Lang.

Doo, George Thomas, F. R. S.: engraver; b. in Surrey, England, Jan. 6, 1800. He became historical engraver to Queen Victoria in 1842, and was elected a Royal Academician in 1856. Among his works are *Ecce Homo*, after Correggio; *Knox Preaching*, after Wilkie; and *Pilgrims Coming in Sight of Rome*, after Eastlake. He exhibited at the great Exposition of Paris in 1867 his engraving of *Saint Augustine and Saint Monica*, after Scheffer, and in 1878 three portraits. D. Nov. 13, 1886.

D'Ooge, Martin Luther: Professor of Greek; b. July 17, 1839, at Zonnemaire, province of Zealand, Netherlands; Ph. D., Leipzig, 1872; LL. D., University of Michigan, 1889; has been principal of Ann Arbor High School; Professor of Greek in the University of Michigan; president of American Philological Association; director American School of Classical Studies at Athens; editor of Demosthenes's *On the Crown* (1875); and the *Antigone* of Sophocles (1884).

Doolittle, Edwin Stafford: See the Appendix.

Doolittle, James Rood: See the Appendix.

Doolittle, Theodore Sandford, D. D., LL. D.: minister and educator in the Reformed (Dutch) Church; b. in Ovid, N. Y., Nov. 30, 1834. He graduated at Rutgers College 1859, and at the Theological Seminary at New Brunswick 1862; became pastor at Flatlands, N. Y., 1862; Professor of Rhetoric, Logic, and Metaphysics in Rutgers College 1864; and vice-president 1890, acting as president for five months in 1891–92. He published *History of Rutgers College* (1879) and *Syllabus of Architecture* (1892). He was editor of the *Christian at Work* from 1873, and a prolific contributor to newspapers and magazines. He was also known as a lecturer on art and other subjects. D. in New Brunswick, N. J., Apr. 18, 1893. Willis J. Beecher.

Doom [O. Eng. *dōm*, judgment, sentence : Goth. *dōms*, judgment; Eng. *deem* : Goth. *dōmjan* is from same root]: the old name given in England to the Last Judgment, and to representations of it in churches by painting or otherwise. Most of these were obliterated in the time of Edward VI., but a fine one still exists in the Church of the Holy Trinity at Coventry.

Doom-book: See Dome-book.

Doom- or **Dum- Palm** (*Hyphæne thebaica*): a tree of Upper Egypt and Central Africa, where it sometimes forms forests, growing even in the deserts. The lower part of the stem is single, and invariably divides at a certain height into two branches, each of these again being bifurcated, always in two sets. The wood is tougher than that of most other palm-trees. It has fan-shaped leaves, globular fruit about the size of an orange, with the outer skin red, inclosing a thin spongy substance which resembles gingerbread. From this substance, which forms an article of food, it has been called the gingerbread-tree. Ornaments are made from the hard, semi-transparent kernel of the fruit. This tree produces the gum resin called Egyptian bdellium, and its fiber is made into ropes which are dyed black.

Doomsday Book: See Domesday Book.

Doon: a river of Scotland; rises in Ayrshire; flows nearly northwestward, and enters the Frith of Clyde 2 miles S. of Ayr. It is 30 miles long, and passes through picturesque scenery. The Doon has been immortalized by the poet Burns. Loch Doon, an expansion of this river, is 5 miles long, and is inclosed by mountains.

Door [O. Eng. *dor* : Germ. *Thor* : Goth. *dŏr*; cf. Gr. θύρα, Lat. *fores*, Skr. *dvâr*]: the panel of wood or other material by which the entrance of a house, etc., is opened or closed. Doors are of different kinds, the most common being made to move on hinges. Others, called sliding doors, are moved on rollers. A trap-door opens vertically over a hole in a roof or floor, while a jib-door is made even with the wall and concealed as nearly as possible.

In architecture great attention has been paid to the ornamentation of doors, and sometimes they have been made of metal, with very ornate decoration, such as the bronze doors or gates of the baptistery of Florence, those of the Capitol at Washington, D. C., and those of Trinity church, New York city.

Doora: See Durra.

Doorak: same as Durak (*q. v.*).

Doornboom, dōrn'bōm (thorn-tree, *Acacia horrida*): a tree growing abundantly in South Africa, so named by the Dutch on account of its sharp and numerous spines. Its usual height is about 30 feet, and the wood is valued for building.

Doostee: same as Desht (*q. v.*).

Do'ra d'Is'tria [from *Istria*, the Roumanian name of the Danube]: the literary pseudonym of Helena Ghika, Princess Koltzoff Massalsky, a Roumanian writer; b. at Bucharest, Jan. 22, 1829; a daughter of Prince Michael Ghika and niece of Prince Alexander Ghika, ex-hospodar of Wallachia. Thoroughly conversant with classical literatures and languages from her home education, she mastered the principal European languages and literature by extensive travels. After an unfortunate marriage to Prince Koltzoff Massalsky in 1849 she lived partly in Russia, partly in Italy and Switzerland. Her principal works are *Monastic Life in the Oriental Church* (1855); *The Heroes of Roumania*; *The Roumanians and the Papacy*; *Women in the Orient* (2 vols., 1858); *On Women, by a Woman* (1864); *The Poetry of the Ottomans* (1873). She was elected member of several scientific societies. D. at Florence, Nov. 22, 1888.

Dora Baltea, dō′răă-băăl-tā′ăă (anc. *Duria Major*): a river of Italy; in Piedmont; rises at the foot of the Little St. Bernard, and enters the Po near Crescentino. Length about 90 miles.

Dorado, El: See El Dorado.

Dorama, dō-raa′măă: a town of Arabia; in Nedjed; 30 miles N. E. of Derayeh (see map of Persia and Arabia, ref. 6–F). The caravans moving between Persia and Mecca halt here to obtain supplies. It was taken in 1818 by Ibrahim Pasha, who killed nearly all the inhabitants. Pop. about 8,000.

Dorasques: See Indians of Central America.

D'Orbigny, Alcide: See Orbigny.

Dor-bug: a name applied in England to the Cockchafer (*q. v.*), and in the U. S. to the numerous species of May or June bugs, *Lachnosterna*.

Dor'cas Society: a benevolent association of ladies, usually of the same congregation, for the purpose of providing the poor with clothing. It is so called from Acts ix. 39: "And all the widows stood by him weeping, and showing the coats and garments which Dorcas made while she was with them."

Dor'chester (anc. *Durnovaria* and *Durinum*): town; capital of Dorsetshire, England; on the river Frome and on the South Downs; 115 miles W. S. W. of London, and 7 miles from the English Channel (see map of England, ref. 14–G). The Southwestern Railway connects it with London and Weymouth. It has a county museum, a free grammar school, a large agricultural market, held weekly, and a trade in ale and beer. Here are the remains of the most perfect Roman amphitheater in England, 218 feet long and 163 feet wide. The seats for the spectators were formed of masses of chalk, rising 30 feet above the arena. It is probable that the Poundbury camp, to the N. W. of the town, is of Roman origin. Durnovaria was one of the principal stations of the Romans in England, and was surrounded with a wall, parts of which are still standing, and a fosse. Cromwell captured and held the town in 1645, and George Jeffries (*q. v.*) held his Bloody Assize here in 1685. Pop. (1891) 7,946.

Dorchester: formerly a separate town of Norfolk co., Mass.; on Dorchester Bay, an arm of Boston harbor; 4 miles S. of Boston, to which city it was annexed in 1869, constituting the Sixteenth Ward. It was settled in 1630 by a party of Puritans, and was named after Dorchester, England, from which many of the colonists came. In Mar., 1776, Dorchester Heights, which commanded the town and harbor of Boston, were fortified by Gen. Washington, and the British soon after evacuated the latter place.

Dorchester: a river-port and capital of Westmoreland co., New Brunswick; on the Memracook river, near its mouth, and on the Intercolonial Railway; 115 miles E. N. E. of St. John (see map of Quebec, etc., ref. 5–I). Large ships can ascend from the Bay of Fundy to this place, which has an active trade. Gas-coal and building-stone are largely exported. Pop., including Dorchester township, about 7,000.

Dorchester, Daniel, D. D.: minister of the Methodist Episcopal Church; b. at Duxbury, Mass., Mar. 11, 1827; educated at Norwich Academy and Wesleyan University; has been active as pastor and presiding elder, and has served in the Connecticut Senate, Massachusetts House of Representatives, as commissioner of idiocy in Connecticut, superintendent of Indian schools for the U. S.; author of *Concessions of Liberalists to Orthodoxy* (Boston, 1878); *Problem of Religious Progress* (New York, 1881); *Latest Drink Sophistries versus Total Abstinence* (1883); *Liquor Problem in All Ages* (1884); *The Why of Methodism* (1887); *Christianity in the United States* (1888); *Romanism versus the Public School System* (1888).

Dordogne, dōr′doñ′: a river rising in the south central part of France; flows nearly westward through the departments of Corrèze, Lot, and Dordogne, and enters the Garonne 13 miles N. of Bordeaux. It is about 350 miles long, and is navigable for 185 miles.

Dordogne: department of Southwestern France; area, 3,545 sq. miles; bounded N. by Haute-Vienne, W. by Charente and Charente-Inférieure, S. W. by Gironde, S. by Lot-et-Garonne, and E. by Lot and Corrèze. It is drained by the river Dordogne. The surface is diversified by hills, marshes, and fertile valleys. The soil is generally sandy. Chestnuts and wine are among the staple productions. It has mines of coal, copper, and iron, quarries of marble and alabaster and manufactures of paper, brandy, hosiery, and iron. Capital, Périgueux, which is also the seat of a bishopric. Pop. (1881) 495,037; (1891) 478,471; (1896) 464,822.

Dordrecht: See Dort.

Doré, dō′rā′, Gustave Paul: figure-painter, illustrator, and sculptor; b. in Strassburg, Jan. 6, 1833; went to Paris at the age of fifteen and began his career by making sketches for illustrated papers; exhibited his first picture in oil, *Battle of Alma*, in 1855; officer Legion of Honor 1879. Doré worked rapidly and produced a large number of pictures. His illustrations are almost countless, including designs for *Rabelais* (1854), Balzac's *Contes Drôlatiques*, *Don Quixote* (1862), Dante's *Inferno* (1861), *Bible* (1865–66), La Fontaine's *Fables* (1867), *Idyls of the King* (1867–68), *The Ancient Mariner* (1876), and Poe's *Raven* (1883). As an illustrator he was marvelously fertile in invention, but a poor technician. He exhibited frequently at the Paris Salon, being exempt from the examination of the jury through his first decoration as chevalier of the Legion of Honor given him by the emperor in 1861. D. in Paris, Jan. 27, 1883.

William A. Coffin.

Doree: same as Dory (*q. v.*).

Dore, Mont, mōñ′dōr′: a group of high mountains in Auvergne, France; department of Puy-de-Dôme. They are of volcanic formation. The highest summit is the Pic de Sancy, which has an altitude of 6,190 feet.

Dore'mus, Robert Ogden, M. D., LL. D.: chemist; son of Sarah Platt Doremus (*q. v.*); b. in New York, Jan. 11, 1829; studied at Columbia College; graduated at the University of New York 1842; studied chemistry; assistant to Prof. Draper in the medical department; went to Europe in 1847 to continue his chemical researches, and graduated at the medical department of the New York University (1850). He was one of the founders of the New York Medical College. In 1861 he was appointed Professor of Chemistry and Toxicology in the Bellevue Hospital Medical College, and soon afterward he was appointed to a similar position in the College of the City of New York. Dr. Doremus has devoted much time to applied chemistry and has patented several processes.

Doremus, Sarah Platt Haines: philanthropist; b. in New York, Aug. 3, 1802; married Sept. 11, 1821, to Thomas C. Doremus; in 1828, with eight other ladies, organized the Greek Relief Society, whose almoner was Rev. Dr. Jonas King; in 1836 aided Madame Henriette Feller in her Grande Ligne Mission to the French peasantry of Canada; with Miss Catherine Sedgwick established in 1842 the Home for Women from Prison, now called the Isaac T. Hopper Home; one of the founders of the House and School of Industry, and a manager of the City Bible Society and of the City Mission and Tract Society from their beginning; in 1849 labored efficiently for the relief of the famine-stricken people of Ireland; in 1854 became vice-president of the Nursery and Child's Hospital; in 1855 aided in organizing the Woman's Hospital Association; in 1863 assisted in organizing the Presbyterian Home for Aged Women. For fifty years she labored in behalf of foreign missions with untiring zeal. Her memorial in this direction is the Woman's Union Missionary Society, organized in New York in 1860, and the prototype of similar organizations all over the U. S. Her labors in behalf of the sick and wounded soldiers from North and South during the civil war were not excelled by those of any other woman in the U. S. D. in New York city, Jan. 29, 1877.

Do'ria: one of the four most noble and powerful families of Genoa. It was attached to the Ghibelline party. In 1339 the families of Doria, Spinola, Grimaldi, and Fieschi, which had by their rivalry long troubled the republic, were exiled.—Paganino Doria, a famous Genoese admiral, gained a naval victory over the Venetian admiral Pisani in 1352.

Doria, Andrea: admiral and patriot, called the restorer of Genoese liberty; b. at Oneglia, Italy, in 1466. He entered the pope's guards and afterward served with honor under the Duke of Urbino and Alfonso of Naples. Returning to Genoa he was rewarded for his military exploits, and rose to the rank of admiral in 1513. For several years he applied himself to the task of suppressing the Turkish corsairs in the Mediterranean. A sincere patriot, he dreaded the loss to Genoa of her independence through the ambition of France or Spain. In 1522 the imperial interest became paramount in Naples, and Doria gave in his allegi-

anee to Franeis I., whose fleet he eommanded with success in the war with Charles V. In 1524 he defeated the imperial fleet near Marseilles. He also captured Genoa, from whieh he expelled the Adorni. In 1528 he abandoned the serviee of Franeis I., and beeame an ally and adherent of Charles V., on the condition that Genoa should be a free and independent state. He entered Genoa in 1529, was welcomed by the citizens, and gave them a free constitution, whieh remained in vigor until the republie ceased to exist. He afterward acted as admiral in the service of the emperor, and gained a victory over the Turks near Patras in 1532. In 1535 he contributed greatly to the conquest of Tunis, but the rest of his career was marred by reverses. He was defeated by the Turks off Prevesa, and his expedition to Algiers with Charles V. in 1541 ended in disaster. Charles V. gave him the title of Prince of Melfi. D. without issue at Genoa in Nov., 1560. See Carlo Sigonio, *De Vita et Gestis A. Doriæ* (1586); Richer, *Vie d'André Doria* (1789).

Do'rians (in Gr. Δωριεῖς): one of the four principal braneches or tribes of the ancient Hellenic people; elaimed that they were descended from Dorus, a son of Hellen. They are supposed to have originally lived in Doris, from which they migrated to the Peloponnesus, where they founded Sparta, Argos, and Messenia. The migration of the Dorians to the Peloponnesus, whieh is called the return of the Heraclidæ, and forms a eelebrated epoeh in ancient chronology, is said to have oeeurred soon after the siege of Troy, in 1104 B. C. Dorian colonies were planted in Crete, Sicily, and Asia Minor. The Dorians were the most powerful and warlike of the Hellenic tribes. They surpassed the Ionians in solidity and earnestness of character, but were less refined and ingenious. Their language was the Doric Dialect (*q. v.*). See K. O. Müller, *Die Dorier* (2 vols., 1824; 3d ed. 3 vols., 1844); Curtius, *History of Greece.*

Dor'ic Dialect: a strongly marked division of the Greek language; distinguishing itself from at least three other important groups of dialects, the Ionic (Attic-Ionie), the Æolic (Lesbie-Thessalian), and the Areado-Cyprian. Its center of distribution seems to have been the mountain districts of extreme Northwestern Greece. The great Dorian migration (about 1000 B. C.) spread it over the Eastern Peloponnesus and the Isthmus, where it displaeed or absorbed the native Achæan; later migrations earried it over the southern islands of the Ægean and to the southwestern coast of Asia Minor; and colonists carried it later still to the shores of Afriea, Sicily, Italy, and elsewhere. The most prominent braneches of the dialeet which have left a reeord in inseriptions or in literature are the following: (1) The Laeonian, probably surviving in the modern Zakonian; (2) the language of the Spartan colonies Tarentum and Heraelea in Italy; (3) the language of Argolis and the island Ægina; (4) the language of Megara and its eolony Byzantium; (5) of Corinth and its eolony Coreyra (Corfù); (6) of the Peloponnesian eolonies in Sicily, especially Syracuse; (7) of Messenia; (8) of the islands Thera and Melos; (9) of Rhodes and its Sicilian eolonies Agrigentum and Gela; (10) of Crete. As compared with its chief competitor, the Attic, it is particularly distinguished by its retention of the inherited broad ā, whieh in Attie had been largely changed to open ē. This characteristie it shares, however, with most other dialects except the Ionie-Attie. Its really peculiar features are the use of the ending -μες (Attie -μεν) in first plural active of verbs, the retention of -τι (Attic -σι) in third personal ending of verbs, the formation of futures in -ξω from verbs in -ζω, the use of active personal endings in the future passive, and certain peculiarities of aeeentuation.

Authorities.—Ahrens, *De Græcæ linguæ dialectis* (1839–43); Meister, *De dialecto Heracliensium Italicorum* in Curtius's *Studien*, iv., 355 ff.; Baunack, *Die Inschrift von Gortyn* (1885); Herforth, *De dialecto Cretica* (1887); Schneider, *De dialecto Megarica* (1882); Müllensiefen, *De titulorum Laconicorum dialecto* (Strassb. Dissert. vi., 131 ff.).

Benj. Ide Wheeler.

Doric Order: a form of column and entablature named from the Dorians, its reputed inventors. From the middle of the seventh century, and perhaps earlier, to the elose of the sixth century B. C. it appears to have been the only order used by the Greeks, except perhaps in Asia Minor, where some authorities ascribe an equal antiquity to the Ionic. The Greeks, whether they originally derived it from wooden prototypes or from primitive structures in stone, developed this order to a wonderful perfection, realized in the Parthenon at Athens (438 B. C.). The column, measuring in height from 4 to 6 or even 7 diameters, and decorated with from sixteen to twenty shallow flutings with sharp *arrises* or edges, rises directly and without a base from a stepped *stylobate* or platform. It tapers slightly toward the capital, which is composed of a spreading eireular echinus and a plain square abacus or cap. The column supports a plain architrave, with a frieze above it having square *metopes* separated by *triglyphs*, the whole crowned by a cornice decorated with *mutules* and *guttae*. The Romans employed a modification of the Greek Doric entablature with a column derived presumably from Etrusean models, more slender than the Greek column, and adorned with a molded base. They rarely used it as a free-standing column, but applied it to the lower stages of arcaded structures like the Coliseum.

A. D. F. Hamlin.

Dorion, dō'ri-ōṅ', Sir Antoine Aime: Canadian jurist; b. at Ste. Anne de la Perade, P. Q., Jan. 17, 1818; educated at Nieolet College; called to the bar in 1842; appointed queen's counsel in 1863; and chief justiee of the Provinee of Quebec in 1874. He represented Montreal in Canada Assembly 1854–61; Hoehelaga in that body 1862–67; and the same county in the Dominion Parliament from that date till 1872, when elected for Napierville, which he represented until his elevation to the beneh. During his political career he held at various periods the portfolios of Commissioner of Crown Lands, Provincial Secretary, Attorney-General, and Minister of Justiee. He was leader of the *Rouges* or Freneh-Canadian Liberal party of the Provinee of Quebec from his entranee into politics until his retirement, and was knighted in 1877. D. May 31, 1891.

Neil Macdonald.

Do'ris [from the Gr. Δωρίς, the name of a daughter of Oceanus and Tethys, and the wife of her brother Nereus]: a genus of marine gasteropodous mollusks belonging to the seetion *Nudibranchiata*. They are found mostly in southern seas, but several speeies are native on northern eoasts. They have an oval body; the mouth is a proboscis with two tentaeula, and the vent is encircled by branched gills. They are sometimes called sea-lemons.

Do'ris (in Gr. Δωρίς): a small mountainous distriet of ancient Greece; bounded by Thessaly, Loeris, Phocis, and Ætolia. It was the original home of the Dorians (*q. v.*), and forms part of the nomarchy of Phocis in the modern kingdom.—The name Doris is also given by some ancient writers to that part of Caria whieh was oeeupied by Dorian colonists and their descendants.

Dormant Animals: See Hibernation.

Dormant Partner: in law, properly a partner who does not actively participate in the eonduet of the partnership business; in an inaccurate but eommon use of the term, a partner whose name does not appear as such; a silent or secret partner.

F. S. A.

Dormer [orig. meaning, a sleeping-room, from O. Fr. *dormeor*, from a deriv. of Lat. *dormi're*, sleep, cf. *dormito'rium*], or **Dormer Window**, also written **Dorment** or **Dormar**: a window inserted on the inclined plane of the roof of a house, the frame being plaeed nearly vertically with the rafters. It is often used for the purpose of lighting the attie or garret of modern dwelling-houses. In some styles of arehitecture, large and showy dormers rising from steep roofs are an important part of the design, especially in the later Freneh Gothie and in the Freneh and German Renaissanee.

Revised by Russell Sturgis.

Dormouse [*dorm*, sleep + *mouse*, because dormant in winter]: a common name for the various members of the family *Myoxidæ*, a group of small rodents related to the miee, but arboreal in their habits. Called dormiee from their habit of lying torpid, or dormant, throughout the greater portion of the winter, waking only on warm days to eat a little of the food which they store up in the fall. They have large eyes and ears, long hairy tails, and soft fine fur. They are found in Europe, Asia, and Afriea. The common dormouse (*Muscardinus avellanarius*) is reddish brown above, yellowish white below, and the tail is bushy. It is about as large as the house mouse, and is noeturnal in its habits. The fat dormouse (*Myoxus glis*) is larger, and was regarded as a dainty morsel by the old Roman epieures. The garden dormouse (*Eliomys nitela*), as its name indieates, frequents eultivated grounds and often does considerable damage to choice fruit, of which it is

very fond. Each jaw contains four molar teeth on each side; there are no cheek-pouches; each of the fore paws has four toes and a rudimentary thumb, and they have five toes on the hind feet. F. A. Lucas.

Dorn, Johann Albrecht Bernhard: Orientalist; b. at Scheuerfeld, Saxe-Coburg, Mar. 11, 1805. He became in 1843 the chief librarian of the imperial library at St. Petersburg, and devoted himself chiefly to the history and languages of Afghanistan, Persia, and Caucasia. D. in St. Petersburg, May 31, 1881. Revised by C. H. Toy.

Dorner, Isaac August, D. D.: Protestant theologian; b. at Neuhausen-ob-Eck, in Würtemberg, June 20, 1809; educated at Tübingen; became Professor of Theology there 1837; at Kiel 1839; at Königsberg 1843; at Bonn 1847; at Göttingen 1853; and at Berlin 1862. He wrote, besides other works, a *History of the Development of the Doctrine of the Person of Christ* (1839; 2d ed. 1845–56; Eng trans., Edinburgh, 1861–63) and an able work entitled *History of Protestant Theology, particularly in Germany* (1867; Eng. trans. 1871, 2 vols); also *History of Pietism, especially in Würtemberg* (Hamburg, 1840); *The Principle of our Church* (Kiel, 1841); *A System of Christian Doctrine* (1879–80; Eng. trans. 4 vols., 1880–82); *System of Christian Ethics* (1885; Eng trans. 1887); his correspondence with Martensen was published in 1888. He visited the U. S. in 1873 as a delegate to the meeting of the Evangelical Alliance. He was the leading German conservative theologian. D. at Wiesbaden, July 8, 1884.

Dor'noch: a royal burgh (established in 1628); capital of Sutherland county, Scotland; on an inlet of the sea called Dornoch Frith; 14 miles N. of Cromarty (see map of Scotland, ref. 5–G). It has an old cathedral, which was restored by the Duchess of Sutherland in 1837. Pop. (1891) 514.

Do'rogobush: a town of Russia; government of Smolensk; on the river Dnieper; about 55 miles E. N. E. of Smolensk (see map of Russia, ref. 7–D). An engagement took place here in Oct., 1812, between the Russians and the rear-guard of the retreating French. The latter partially burned the town. Pop. 9,000.

Dorp: a town of Prussia; in the Rhine province; on the Wupper (see map of German Empire, ref. 5–C); has iron, steel, and paper factories. It was before 1849 an insignificant place, but since that time, like many other towns in the Wupper valley, it has greatly increased, and has become the center of a considerable manufacturing industry, owing principally to the presence of extensive coal-deposits. Pop. 13,500.

Dor'pat, or **Derpt** (Russ. *Yoorief*): a town of Russia; government of Livonia; on the river Embach; 138 miles N. E. of Riga (see map of Russia, ref. 6–C). It is well built, and has a stone bridge across the river. The old ramparts have been converted into gardens and public promenades. Here Gustavus Adolphus founded in 1632 a university which became a large and celebrated institution. Nearly all the lectures at the university are given in the German language, but the Russian Government has since May, 1877, turned it into a thoroughly Russian institution. Struve and Mädler have successively directed the astronomical observatory of Dorpat, which their labors have made famous. There are five faculties in the university and about 2,000 students. Dorpat was founded in 1030, and became an important town, but sank into decay. It was captured in 1625 by the Swedes, and in 1704 by the Russians, under whom it revived. Pop. (1897) 42,421.

Dörpfeld, Wilhelm: See the Appendix.

Dorr, Julia C. (*Ripley*): See the Appendix.

Dorr, Thomas Wilson: politician; b. in Providence, R. I., Nov. 5, 1805; graduated at Harvard in 1823: was a Democrat and a leader of the suffrage party. Under the old charter the right to vote was limited to men who possessed a certain amount of real estate, and to their eldest sons. In 1841 the suffrage party formed a new constitution, and chose Mr. Dorr Governor of the State. His official action was resisted in May, 1842, by the government chosen according to the old charter. Dorr was arrested, convicted of treason, and sentenced to imprisonment for life, but was pardoned in 1847. D. in Providence, Dec. 27, 1854. See Dorr Rebellion.

Dorrego, dōr-rā'gō, Manuel: Argentine statesman; b. at Buenos Ayres, 1787. He studied law, and in 1810 went to Santiago, Chili, to complete his legal education there. The Chilian revolution breaking out that year, he joined the patriots and served through the earlier campaigns. Returning to Buenos Ayres he joined the army engaged against the Spaniards in Upper Peru (Bolivia), attaining the rank of colonel. In 1816 Pueyrredon banished him for alleged acts of insubordination, and he went to the U. S. Returning after some years he became the leader of the federalist party, and in Aug., 1827, he was elected governor of Buenos Ayres. He at once undertook to organize a new confederation of the provinces, and at first was successful. In 1828 the war with Brazil was brought to an end, both countries agreeing to recognize the independence of Uruguay, which had been the territory in dispute. A revolt of the army under Lavalle compelled Dorrego to fly from Buenos Ayres, Dec. 1, 1828; joined by the forces of Rosas he attempted to regain the city, but was defeated and captured by Lavalle, and shot without trial Dec. 13, 1828. Dorrego was a man of estimable character; his lawless execution gave rise to disorders which culminated in the tyranny of Rosas a few years later. Herbert H. Smith.

Dorr Rebellion: a popular uprising in Rhode Island (1841–42) under Thomas Wilson Dorr (*q. v.*), for the purpose of securing an extension of the suffrage. Up to that time the people of Rhode Island had lived under the charter adopted as early as 1663, according to which none but freeholders of an estate valued at not less than $134, or renting for $7.00 a year, were entitled to vote. Representation in the Legislature was also very unequal, in consequence of the growth of certain towns and the decline of others. The Legislature, made up under the provisions of the charter, was stubbornly opposed to any important change. New constitutions were proposed in 1824 and in 1834, but were defeated. The popular zeal, however, could not be suppressed or ignored. A suffrage association was formed, and a convention, summoned without regard to legal voters, was brought together in 1840, and having framed a new constitution providing for universal suffrage and equal representation, submitted it to popular vote. Another convention, called by the Legislature, proposed a constitution providing for a more limited suffrage. The so-called people's constitution was adopted by a vote of 14,000 against 8,000. There were charges of fraud in the election, but it was evident that the supporters of the people's constitution now stood face to face against the regularly organized government under the charter. The Legislature undertook to suppress agitation by declaring that any persons who should preside over illegal meetings or allow their names to be used on illegal tickets should be subject to fine and imprisonment; but the agitation, so far from being discontinued, increased to such an extent that the Governor called for aid upon the President of the U. S. President Tyler replied that he would render assistance in case any violence should be committed. But the populists were in no way intimidated. They proceeded with their election and chose as Governor the most conspicuous of the popular leaders, Thomas W. Dorr. Civil war on a small scale immediately followed. Dorr organized his government at Providence, while Governor King at Newport was helpless. The Governor renewed his call upon the President, and U. S. troops arrived at Newport in May, 1842. Dorr made an attempt to get possession of the Providence arsenal, but was unsuccessful. This defeat discouraged many of his followers, and Dorr himself fled from the State. But he soon returned. Throwing up intrenchments a few miles from Providence, he assumed an attitude of defiance. It became evident, however, that even the insurgents had little faith in his courage or ability; for when within a week several thousand men had volunteered to march against them, they found that the works had been abandoned. Though it is customary to refer to the movement of which Dorr was the leader with ridicule, it can hardly be denied that it was indirectly the means of securing the desired end. The insurgents disbanded in June; in the following September a State convention adopted a constitution which embodied nearly every provision that had been advocated by Dorr and his followers.

Authorities.—King, *The Life and Times of Thomas Wilson Dorr* (Boston, 1859); *Might and Right* [*A History of the Dorr Rebellion*], *by a Rhode Islander* (Providence, 1844); Jacob Frieze, *A Concise History of the Efforts to obtain an Extension of Suffrage in Rhode Island* (Providence, 1842).
C. K. Adams.

Dorset, Charles Sackville, K. G., Sixth Earl of: an English courtier and wit; b. Jan. 24, 1637; a son of Richard,

the fifth Earl of Dorset. He was brave, witty, and generous, and had superior talents, but was indolent and unambitious. His popular qualities rendered him a general favorite. He was distinguished as a patron of literary men, and bestowed his bounty with equal judgment and liberality. Dryden was one of the authors who enjoyed his bounty. Lord Dorset was appointed lord chamberlain by William III. in 1689. He wrote several admired satires and songs. D. at Bath, Jan. 16, 1706, and was succeeded by his son Lioncl Cranfield, seventh earl, who was created Duke of Dorset in 1720. Charles Sackville Germain, fifth duke, died unmarried July 29, 1843.

Dorset, Thomas Sackville, K. G., First Earl of: statesman and poet; b. at Buckhurst, Sussex, England, in 1536. He wrote a tragedy entitled *Gorboduc, or Ferrex and Porrex* (1561), which was praised by Sir Philip Sidney, and also the *Induction to the Mirror for Magistrates* (1563). He received the title of Lord Buckhurst in 1566, and was sent as minister to France in 1570. In 1599 he succeeded Lord Burleigh as lord treasurer of England. He was afterward created Earl of Dorset by James I. D. at Whitehall, Apr. 19, 1608, and was succeeded by his son Robert.

Dorsetshire, or **Dorset**: a county in the southern part of England; bounded N. by Somerset and Wiltshire, E. by Hampshire, S. by the English Channel, and W. by Devonshire. Area, 980 sq. miles. The surface is partly hilly and occupied by chalk-downs. The chief rivers are the Frome and the Stour. Among the mineral resources are chalk, china clay, and the celebrated Portland building-stone. The chalk-downs or hills produce fine pasture, on which vast numbers of South Down sheep feed. Dorset is mainly a pastoral county, and exports cattle, sheep, butter, and cheese. From the middle of March to midsummer great quantities of mackerel are caught along its shores. The chief towns are Dorchester (the capital), Poole, Bridport, Weymouth, and Shaftesbury. The Saxons called the country *Dornsota* or *Dorsola*, from the root *dwr*, water. In the Roman period it belonged to *Britannia prima*, and in the British, previous to the landing of Cæsar, it was, according to Ptolemy, inhabited by a tribe of the name *Durotriges*. Pop. (1891) 193,542; (1901) 202,093.

Dorsey, James Owen: anthropologist; b. in Baltimore, Md., Oct. 31, 1848. He attended the high school of that city and the Theological Seminary of Virginia; ordained a deacon of the Protestant Episcopal Church (1871), and became missionary among the Ponka Indians in Dakota Territory. From 1878 until his death in Washington, D. C. (Feb. 4, 1895), he was engaged in linguistic and sociologic work for the Bureau of Ethnology. Among his published works are the following: *Omaha Sociology* (Third An. Rept. of the Bur. of Ethnology); *Osage Traditions* (Sixth An. Rept. of the Bur. of Ethnology); *Contributions to North American Ethnology*, vol. vi.; *The Dhegiha Language, Myths, Stories, and Letters* (published by the Bureau of Ethnology); *Omaha and Ponka Letters* (Bureau of Ethnology). He contributed numerous articles to the *American Antiquarian*, *American Naturalist*, *American Anthropologist*, and *Journal of American Folk-lore*.

Dort, also called **Dor'drecht** (Lat. *Dordracum*): a fortified town of the Netherlands; in South Holland; on an island in the Meuse; 10 miles S. E. of Rotterdam (see map of Holland and Belgium, ref. 7–E). It is traversed by canals, is accessible to large ships, and has an active trade in grain, flax, timber, and salt fish. Here are ship-building docks, sugar-refineries, sawmills, and manufactures of tobacco, white lead, etc. In 1421 a terrible inundation destroyed seventy villages, and converted the ground where Dort stands into an island. The Synod of Dort met here in 1618, and condemned the doctrines of Arminius. Pop. (1896) 36,687.

Dortmund, dōrt'moont: town of Prussia; in Westphalia; on the Embscher and on the Cologne and Minden Railway; 47 miles N. N. E. of Cologne (see map of German Empire, ref. 4–C). It has several fine churches, three hospitals, a Protestant gymnasium, and a Realgymnasium; also manufactures of cotton, linen, and woolen fabrics, cutlery, and nails. It was a city of the Hanseatic League, and was the chief seat of the Fehmic Court. Its trade was nearly ruined by the Thirty Years' war. Dortmund was ceded to Prussia by the Congress of Vienna in 1815. Pop. (1900) 142,418.

Dort, Synod of (in Lat. *Synodus Dordracena*): a great synod of the national Church of Holland; convened at Dort from Nov. 13, 1618, to May 19, 1619, consisting of 39 ministers, 18 ruling elders, and 5 professors, deputies from the several states of the Netherlands, besides 24 foreign deputies representing the Anglican and most of the Calvinistic churches. The synod was convoked by the States-General on account of the controversies between the Gomarists (Calvinists) and Remonstrants (Arminians). The latter derived their name from the remonstrance which they addressed to the States-General defining their religious doctrines in the five articles henceforth known as the five points of Arminianism. The synod was convened in the Calvinistic interest, and there has been much difference of opinion as to the fairness of its proceedings, because of its refusal to permit the Arminian deputies to aid their brethren who were cited before the synod to defend their views. The principal work of the synod was the preparation of canons setting forth the Calvinistic doctrines, and the publication of an ecclesiastical censure against the Remonstrants, calling upon the civil power to enforce the decrees of the synod by banishment, imprisonment, or fines imposed upon the refractory. The canons are ably drawn up, and were officially received by the Reformed churches of the Low Countries, France, Switzerland, and the Palatinate, but were some years later rejected by the Church of England. See the official *Acta Synodi* (4to, 1620). Revised by F. M. Colby.

Dory, or **John Dory** [*Dory* is a corruption of Fr. *dorée*, gilded, in allusion to its golden tinge. John may be merely the proper name, or, as some give it, a corruption of Fr. *jaune*, yellow]: a marine fish (*Zeus faber*) having the membrane of the back fin extending, like streamers, far beyond the spines. The head is large, and there is a conspicuous black spot on each side. It is found on the coasts of Europe, and attains a length of 18 inches. It is among the various fishes pointed out by tradition as the one from whose mouth St. Peter took the penny, the spots on the sides being the impression of his thumb and finger.

F. A. Lucas.

Dosith'eans: an unimportant Samaritan sect founded in the first century after Christ by Dositheus, who is said to have represented himself to be the Messiah. In the fourth century there still remained a few who believed implicitly in the claims of Dositheus.

Dossert, Frank G.: organist and composer; b. in Buffalo, N. Y., 1861; at the age of eighteen succeeded his father as organist of the cathedral. He has held several important organ positions, and since 1886 has been organist of St. Stephen's Roman Catholic church, New York city. His compositions include songs, motets, several masses, and other sacred works, a mass in E minor, and some pieces for orchestra. One of his masses, dedicated to Pope Leo XIII., was produced at Rome in 1893. D. E. Hervey.

Dossi, dos'sĕ, Giovanni: painter; b. at Dosso, near Ferrara, either in 1474 or 1479. He studied under Lorenzo Costa. In connection with his brother Battista he worked much at Ferrara and at Modena. Perhaps his most important work still existing is the *Madonna and Saints* in the Ferrara Museum. He died at Ferrara in 1542. He is often called Dosso Dossi.

Dost Mohammed: See Afghanistan.

Dostoïev'ski, Fédor Mikhaïlovitch: Russian novelist; b. in Moscow in 1822. His literary career began in 1846 with the book *Poor People*, in which he described vividly and pathetically the life of the small tradesman and laborer in Russia. In 1849 came an event of the most terrible consequence in his own life. An eager liberal, he had associated himself with a club whose aim was the reform of governmental abuses. Suspicion soon fell upon the club; its members were arrested and at once condemned to death. Only on the scaffold itself was their sentence commuted to banishment to Siberia. Dostoïevski was given ten years of hard labor in place of death. The full penalty was, however, not inflicted; by 1854 he was relieved of the requirement of hard labor. Yet it was 1860 before he was able to go to St. Petersburg. There he found his wife hopelessly broken in health, his own fortune ruined, and want staring him in the face. The rest of his life was given to the hard struggle of earning his bread with the pen. In 1861 he published *The Downtrodden and Oppressed*, a novel full of the same sympathy for the poor and weak and lowly that he had shown before his exile. Still he would not ally himself with the nihilists; and in 1867 his novel *Evil Hearts* seemed to contain his renunciation of their

principles. Later in the same year the greatest of his works, *Crime and Punishment*, made this still more clear. In fact this terrible book, with its psychological analysis of apparently the utmost realism, did, taken as a whole, seem to show in human life a thread, a tendency, a purpose of a distinctly spiritual and even religious character. The extreme party was not slow to see this, and denounced the author as a reactionary and mystic. In 1869 appeared *The Idiot*; in 1875, *Podrostok*, *The Brothers Karamrasov*, *Krotkaia*, and *The Underground Spirit*. In 1876 Dostoïevski undertook to produce by himself alone a periodical entitled *An Author's Journal*, in which he printed from time to time his reflections upon the fundamental questions interesting Russia, always from the point of view of an ardent Slavophil. Although denounced by the nihilists, he remained exceedingly popular among the educated young men and women, even of liberal leanings, in Russia. His death was the cause of almost national mourning. D. in St. Petersburg, Jan. 28 (Feb. 9 of the English calendar), 1881.

A. R. Marsh.

Dotis: same as Totis (*q. v.*).

Dotterel: the popular name for a species of plover (*Eudromias morinellus*), common in Europe and Asia. The plumage above is varied with black and rusty red, the belly is black, the breast yellow, and there is a band of white and black on the neck. The bird is about 9 inches in length. The young, which run about as soon as hatched, are good examples of protective coloration, so blending with the sandy pebbly places which they frequent as to escape detection by crouching flat on the ground. F. A. Lucas.

Douai, doo'ā' (in Lat. *Duacum*): fortified town of France; department of the Nord; on the river Scarpe and on the Chemin de Fer du Nord; 21 miles S. of Lille (see map of France, ref. 2–F). It is well built, has several fine churches and hospitals, a theater, an arsenal, a botanic garden, and a national college representing the Douai University founded by Philip II. in 1562, with which was affiliated the famous college for the education of English Roman Catholic priests, founded by Cardinal Allen in 1562. For more than two hundred years Douai was the center of English Roman Catholicism and the refuge for the persecuted members of that Church. Missionaries from the college returned to England and worked for the restoration of the old faith. Of its alumni it is stated that thirty became bishops, while 160 sacrificed their lives on the scaffold for the papal cause. The college was suppressed and its property confiscated by the French Government, Oct. 12, 1793. After their expulsion the members of the college, among whom was the historian Lingard, founded a similar college at Crook Hall, afterward transferred to Ushaw, near Durham, England. At Douai are manufactures of cotton stuffs, lace, gauze, paper, glass, pottery, and soap. Douai existed in the time of Cæsar. It has often been besieged and taken by the French and Flemings. Pop. (1896) 31,397.

Revised by F. M. Colby.

Douai, or **Douay**, **Bible**, **The**: a translation of the Bible by English Roman Catholic divines connected first with the college at Rheims, and afterward with the college at Douai. The translators were Gregory Martin, William Allen, Richard Bristow, William Reynolds, and others. The New Testament was published at Rheims in 1582. The Old Testament, then already translated, was published at Douai in 1609–10. Both Testaments were translated from the Vulgate. The annotations were quite copious, and intensely Roman Catholic. Numerous editions have appeared, which greatly vary both in the text and in the notes. An exact reprint of the original Rheims New Testament was published in New York in 1833. Of the original Douai Old Testament there has been no exact modern reprint. See Henry Cotton, *Rhemes and Doway* (Oxford, 1855).

Doub, Peter, D. D.: minister of the Methodist Episcopal Church South; b. in Stokes co., N. C., Mar. 12, 1796. He joined the Virginia Conference in 1818. Many thousands in Virginia and North Carolina were brought into the church by his ministry. He was a polemical preacher of great power. He was for three years before his death Professor of Biblical Literature in Trinity College, N. C. D. in Greensboro, N. C., Aug. 24, 1869.

Double Consciousness, sometimes called **Double Personality**: a form of mental disease involving confusion in the idea of personal identity. Persons with this disorder are variously affected; some conceive that parts of their frame belong to another person; others that they are inhabited by another entity in addition to their own, and which opposes itself to their will and interests; others appear to be possessed at one time of one personality, at another of another, according to the mental or physical conditions under which they are placed. In the last-named form of the phenomenon the person affected can not remember in one state the events which happened during the other. The phenomena of double consciousness have never received a satisfactory explanation. For some striking examples of the last-named variety, see Wayland, *Intellectual Philosophy*. See also Psychology (*Physiological*).

Doubleday, Abner: general; b. in Ballston Spa, N. Y., June 26, 1819; graduated at West Point in 1842. He became a captain in 1855, and was one of the garrison of Fort Sumter in 1861; brigadier-general of volunteers Feb., 1862; major-general Nov., 1862, and engaged in battles of Manassas, South Mountain, Antietam, Chancellorsville, and at Gettysburg commanded the First Corps in the first day's fight after the death of Gen. Reynolds; brevet brigadier and major-general U. S. army; became a colonel of infantry in 1867. Retired in 1873. He published *Reminiscences of Forts Sumter and Moultrie in 1860–61* (New York, 1876) and *Chancellorsville and Gettysburg* (1882). D. Jan. 26, 1893.

Double Refraction: a phenomenon exhibited by Iceland spar and several other crystals. A ray of common light passing through them is divided into two polarized rays, which take different directions and are refracted according to different laws. See Refraction and Polarization.

Double Stars, or **Binary Stars** (see Binary System): sidereal systems composed of two stars, one revolving around the other, or both about a common center. These were noticed by Sir William Herschel in 1803. Subsequent observations have confirmed this discovery, and in some instances the periods of revolution have been determined. Some of these binary systems have periods of great length, and some of them afford curious instances of contrasted colors, the color of the smaller star being complementary to that of the larger. In such instances the larger star is usually red or orange, and the smaller star blue or green.

Doublets: in historical grammar a pair of words in a given language, which have been differentiated out of what was originally one and the same word; thus *hotel* and *hospital*, which are historical descendants of Lat. (vulg.) *hospita'le*. The differentiation of form is almost always found to be utilized for the expression of some variety of signification. It is this indeed which, by giving the doublets a *raison d'être*, insures their existence. Their linguistic importance lies in the fact that their divergence of form exhibits an accurate measure of the historical forces that make for change in the different linguistic routes which the words have followed. The differentiation of form may be either phonetical or analogical (minor variations of suffix being disregarded in our classification).

A. Phonetical differentiation may make itself apparent—(1) When a given language borrows a word cognate to one of its own from a related language; thus *name* is the native English word of Teutonic stock, whereas *noun* comes viâ French from the cognate Lat. *nomen*; so *brother* : *friar* (O. Fr. *frere*); so the verb *ward* (= Germ. *warten*) : *guard*, which has come to us from Germ. viâ Old French; so *wain* (= Germ. *wagen*) : *wagon* (Dutch). (2) When a word is borrowed from the earlier sources of a language. This is called "learned" borrowing. Thus Fr. *meuble* and *mobile* both represent Lat. *mŏbilis*, cf. *chose* : *cause*, *droit* : *direct*, *mûr* : *mâture*, *chétif* : *captif*. (3) When different dialects of the same language contribute cognate forms to its literary language; thus *church* : *kirk* (No. Engl. Scandin. influence); so *road* : *raid* (cf. *inroad*), *whole* : *hale*, Germ. *sanft* : *sacht* (Low Germ.); Lat. *popina* : *coquina*; *palumba* : *columba*. (4) When a language borrows from two different dialects of another language, or at two different periods of its history; thus *suit* (from O. Fr.) : *suite* (from Mod. Fr.) = Lat. *secta*; *hostel* : *hôtel*; *reason* : *ration* = Lat. *ratio-nem*; *beast* : *bête* = Lat. *bestiam*; *corpse* : *corse* : *corps*; *rout* : *route* = Lat. *ruptam*; *cadence* : *chance*; *fashion* : *façon* = Lat. *factionem*. (5) When a language borrows cognates from two languages: thus *guitar* (Fr.) : *zither* (Germ.) = Gr κιθάρα; *gopher* (Heb.) : *cypress* (Gr.); *czar* (Russ.) : *kaiser* (Germ.) = Lat. *Cæsar*: *castle* (Lat.) : *château* (Fr.); *blame* (O. Fr.) : *blaspheme* (Lat.); *preach* (O. Fr.) : *predict* (Lat.): *place* (O. Fr.) : *piazza* (Ital.). (6) When a language gives per-

manent recognition in its literary form to variants of a single word originally due to different positions in the phonetic sentence: thus *of* : *off*; *one* : *an*; Lat. *prehendere* : *prendere*: *providens* : *prudens*; Germ. *jungfrau* : *jungfer*.

B. Analogical differentiation appears when a neologism is given a permanent place beside the old form by its appropriation of a special signification or function; thus *mister* (*Mr.*) formed from *master* by the analogy of *mistress* is made permanent by its special use as a title; so *clothes* : *cloths*; *brethren* : *brothers*: *pence* : *pennies*; Fr. *plier* : *ployer*: *sachant* : *savant*; Germ. *bescheiden* : *beschieden*; *verdorben* : *verderbt*; Lat. *partim* (old accus. used as adv.) : *partem*.

Some doublets are merely orthographical; thus *to* : *too*; *bass* (music. term) : *base* (adj.).

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Doubloon' [from Fr. *doublon*, from Span. *doblon*: Ital. *doppione*, from deriv. of Lat. *duplus*, double]: a Spanish gold coin nearly equivalent to sixteen dollars. It is the double of a pistole.

Doubs, doobz (anc. *Dubis*): a river of France; rises in the Jura Mountains, flows nearly southwestward through the departments of Doubs and Jura, and enters the Saône at Verdun-sur-Saône. Total length about 250 miles. The chief towns on its banks are Besançon and Dôle. It is navigable to Dôle.

Doubs: a department in the eastern part of France; bordering on Switzerland. Area, 2,018 sq. miles. It is intersected by the river Doubs. The surface is traversed by several ridges of the Jura Mountains, which are covered with forests of pine, walnut, and other trees. The soil of the valleys is fertile, and produces good pasture. Here are mines of coal and iron and quarries of marble. Among the exports are cattle, horses, iron, and butter. Capital, Besançon. Pop. (1881) 310,827; (1891) 303,081; (1896) 302,046.

Doubting Insanity (in Fr. *folie du doute*): a form of melancholia in which the patient pauses in doubt as to which of two trivial things must be done. This very peculiar condition is not to be regarded as a form of insanity itself, but is a symptom in certain cases, and has occurred in a number of illustrious men not regarded insane. It is well known that Samuel Johnson would not pass along the streets of London without touching each post, and if he neglected to touch one he returned to it. Flaubert said the "mania of doubt exhausts me. I doubt about everything; even about my doubts." Certain persons can not decide which stocking or shoe to put on first, and would pause for hours should no help be given. While thus the insanity of doubt not rarely occurs in those of generally sound mind, it is apt to be met in its more pronounced types only in the otherwise insane. William Pepper.

Doucet, doo'sā', Lucien: figure and portrait painter: b. in Paris, Aug. 23, 1856. Pupil of Lefebvre and Boulanger; Grand Prix de Rome 1880; second-class medals, Salon, 1887, and Paris Exposition, 1889; first-class medal, Paris Exposition, 1889, for pastels; Legion of Honor 1891. His work is individual and extremely brilliant technically; his portraits of women are graceful and refined. *Portrait of Mme. Galli-Marie*, a remarkable work, is in the Marseilles Museum. Studio in Paris. W. A. C.

Dough: See Cookery.

Dougherty, dokh'er-ti, Daniel: lawyer; b. of Irish parentage, in Philadelphia, Oct. 15, 1826; at eighteen began the study of law and was admitted to the bar in 1849; soon became one of the foremost advocates in Philadelphia; was a prominent speaker on the Democratic side, but being an uncompromising Unionist left the Democratic party in 1861; returned to the Democratic party on nomination of Samuel Tilden in 1876; in 1880 nominated Gen. Hancock as a candidate for the presidency, in a speech which won for him the title "silver-tongued orator." Another remarkable oration was made at the opening of the Roman Catholic lay congress in Baltimore, Nov. 11, 1889. He nominated Grover Cleveland as a candidate for the presidency in 1888. Mr. Dougherty was an orator of great finish and power, and was as well known on the lecture platform as for political addresses. Although prominent in politics, he never held office. In the later years of his life he removed from Philadelphia to New York, and devoted himself mainly to the law. D. Sept. 5, 1891.

Doughty, dow'ti, Thomas: landscape-painter: b. in Philadelphia, Pa., July 19, 1793. One of the earliest of the landscape-painters of the U. S., having begun to paint about 1820. He was self-taught. Five of his pictures are in the permanent collection of the Pennsylvania Academy, Philadelphia, and possess an historical interest merely. D. in New York, July 24, 1856. W. A. C.

Douglas, dŭg'las: a seaport and the chief town of the Isle of Man: on the east coast: 80 miles N. W. of Liverpool (see map of England, ref. 5–D). It stands on a picturesque bay, and has a harbor which will admit vessels drawing 10 to 12 feet of water. It contains a custom-house, handsome villas, good hotels, and baths. The excellence of its sea-bathing renders this an important watering-place. Pop. about 18,000.

Douglas: the name of an ancient noble family of Scotland which has produced many eminent men. The first member of the family who appears on record was William of Douglas, 1175–1200. By far the most famous member of the family before it entered into the earldom was the Good Sir James, known as the Black Douglas, the hero of many battles in the Scotch war of independence, the bravest and most faithful supporter of Robert Bruce. He was slain in 1330 while bearing the heart of his royal master to the Holy Land. Sir William, who had been made the first Earl of Douglas in 1357, was a competitor for the crown in 1371, but agreed to recognize his rival, Robert II., on the condition that his son James should marry a daughter of that king. The Earl of Douglas died in 1384, and was succeeded by his son James, who was killed at the battle of Otterburn in 1388. As he left no lawful issue, Archibald the Grim, a natural son of Sir James the Good, became the third Earl of Douglas. He died in 1401, leaving a son, Archibald, the fourth earl. This was Douglas the Tineman, or loser, so called from his misfortunes. He was severely wounded at the battle of Homildon Hill in 1402 and taken prisoner by Hotspur. In the battle of Shrewsbury in 1403, though he displayed great bravery, he was again wounded and captured. He went to France where he became Duke of Touraine, and was killed at Verneuil in 1424. He was succeeded by his son Archibald, the fifth earl, who died in 1439. His son and heir William, the sixth earl (b. about 1422), became an object of fear and suspicion to the court on account of his power and foreign possessions. He was beheaded after a hasty trial, Nov. 24, 1440, and left no issue. The earldom was then given to his granduncle James, who died in 1443 and was succeeded by his son William, the eighth earl, a powerful and turbulent person. He was appointed lieutenant-general of the kingdom by James II., but soon lost the royal favor. He was killed by that king Feb. 22, 1452, and was succeeded by his brother James, ninth Earl of Douglas, who waged open war against King James II. in 1454. He was defeated and taken prisoner in 1484, and died in 1488, when that branch of the Douglas family became extinct. The Earls of Angus and the Earls of Morton, besides other noble lines, belonged to the family of Douglas, which is now represented in the peerage by the Earls of Selkirk.

Revised by F. M. Colby.

Douglas, Archibald: fifth Earl of Angus, surnamed Bell the Cat, was a son of George, the fourth earl, who had been rewarded for his loyalty to the king against the older branch of the family by a grant of a portion of the latter's estates. Archibald was a powerful and ambitious subject, and held the highest offices in the state. He was the father of Gawin Douglas, the poet, and of other sons. He derived his popular name from his boldness in heading the disaffected nobles who in 1488 seized and imprisoned King James III. D. in 1514. His grandson Archibald became the sixth Earl of Angus, and married in 1514 Margaret, who was a sister of Henry VIII. of England and widow of James IV., of Scotland. He had a daughter, who became the wife of the Earl of Lennox and the mother of Lord Darnley. The sixth earl died about 1660, and his title was inherited by his nephew George, who was a brother of Regent Morton. The eleventh Earl of Angus was created Marquis of Douglas in 1633. See David Hume, *History of the Houses of Douglas and Angus* (1644).

Douglas, David: botanist: b. at Scone, in Perthshire, Scotland, in 1798. As an agent of the London Horticultural Society he visited the U. S. in 1823 to collect botanical specimens. He returned to England in 1827, and afterward went on a scientific excursion to the Sandwich islands, where he was killed by a wild bull July 12, 1834.

Douglas, Gawin: Scottish poet; b. in 1474; the third son of Archibald, fifth Earl of Angus. He was educated for the Church, and became Bishop of Dunkeld in 1515. His most remarkable production is a translation of Vergil's *Æneid* into Scottish verse (1513), which is highly commended. His chief original poem is *The Palace of Honor*. D. in 1522.

Douglas, George Cuninghame Monteath, D. D.: scholar and minister of the Free Church of Scotland; b. in Kilbarchan, Renfrewshire, Scotland, Mar. 2, 1826; educated in the University of Glasgow and New College, Edinburgh; pastor at Bridge of Weir, Renfrewshire, 1852–57. Then he became Professor of Hebrew and Old Testament Exegesis in the Free Church College, Glasgow, and, later, principal of the college. Among his published works are articles in Fairbairn's *Imperial Bible Dictionary* (1866); annotated translation of Keil's *Introduction to the Old Testament* (2 vols., 1869–70); *Why I still believe that Moses wrote Deuteronomy* (Edinburgh, 1878); *The Book of Judges* (1881); *The Book of Joshua* (1882); *The Six Intermediate Minor Prophets* (1890), the last three being in the Dods and Whyte *Handbooks for Bible Classes*; *A Short Analysis of the Old Testament* (1889). He was a member of the British company of the revisers of the Old Testament.

Willis J. Beecher.

Douglas, Stephen Arnold: statesman; b. at Brandon, Rutland co., Vt., Apr. 23, 1813. He entered upon an academical course, first at Brandon, Vt., and then at Canandaigua, N. Y. At the latter place he remained until 1833, and took up the study of the law at the office of the Messrs. Hubbel, and prosecuted this in connection with his academic course. After some wanderings in the Western States in quest of a new home where his fortunes were to be tried, he took up his abode at Jacksonville, Ill., where, after teaching school for three months, he was admitted to the bar, and opened an office in 1834. He rapidly rose in his profession. Within a year from the time that he received his license to practice he was elected attorney-general of the State. Having been reared in the Jeffersonian school of politics, Mr. Douglas zealously espoused the Democratic side on all public questions then agitated, and soon became one of the most popular orators of his party in Illinois. He was at an early day in his political life styled "The Little Giant," in allusion to his diminutive stature in contrast with the extent and comprehensiveness of his intellectual powers. In 1835 he resigned his position as attorney-general upon his being elected a member of the State Legislature. In 1841 he was chosen one of the judges of the Supreme Court of the State. This position he resigned in 1843 to take a seat in the House of Representatives of the Congress of the U. S.

When Mr. David Wilmot, of Pennsylvania, in Aug., 1846, moved his celebrated proviso for slavery restriction to any new territory that might be acquired from Mexico in a treaty of peace, Mr. Douglas was one of five only in the House, from the entire North, who took decided position against that measure. The internal polity and domestic institutions of the several States composing the Union were subjects, in his judgment, over which the Federal legislative authority did not extend under the limitations of the Constitution.

In 1847 he was elected to the Senate for a full term of six years. In that body he was no less distinguished than he had been in the House. No man in the Senate, not excepting Mr. Clay or Mr. Webster, acted a more conspicuous part than he did in what is known as the Compromise or adjustment of the sectional questions of 1850. In 1852 he was again elected to the Senate for another full term. Under his lead the Kansas-Nebraska bill was triumphantly carried in the Senate, on the grounds that the principle of a division of the public domain between the sections by the Missouri or any other line had been totally abandoned by the adjustment of 1850, and the principle of non-intervention by Congress anywhere in the Territories substituted in its stead. On the like ground it was triumphantly carried in the House, and constitutes what is known as the "Territorial legislation of 1854." (See *Harper's Magazine*, Sept., 1859.) In 1858 Mr. Douglas was again re-elected to the Senate for another full term, after one of the fiercest and bitterest contests ever before waged in the U. S. for a similar position.

As early as 1852 the name of Mr. Douglas had been brought prominently before the Democratic nominating convention at Baltimore as a candidate for the presidency, but, at his own instance, was not pressed by his friends. In 1856 it was again in like manner presented to the Cincinnati convention, but as soon as he discovered that Mr. Buchanan had a majority in that body he gave positive instructions to his friends in that convention by telegram from Washington to withdraw his name and not to allow it to be used in any contest for the nomination under the two-thirds rule. The platform of political principles which had been adopted there before the subject of nominating candidates had been taken up was just such as had governed the whole of his public life, and he gave Mr. Buchanan a cordial support upon his indorsement of them. In 1860, after his triumphant return to the Senate at his last election, he was the most prominent candidate of the Democracy of the U. S. for the presidential nomination at the convention held that year in Charleston, S. C., and very probably would have received it by a two-thirds vote but for the withdrawal of the delegates of the States of Alabama, Arkansas, Florida, Louisiana, Mississippi, South Carolina, and a majority of those from Georgia. The presidential canvass that year was perhaps the most exciting that had ever occurred since that between Mr. Jefferson and the elder Adams in 1800. Four tickets for President and Vice-President were in the field—Lincoln and Hamlin, supported by the Republicans; Bell and Everett, supported by those styling themselves the American party; Douglas and Johnson, supported by one wing of the Democracy, and Breckenridge and Lane, supported by the other. The chief objection to Mr. Douglas on the part of his former Democratic associates, who refused to support him, was what was called his squatter-sovereignty doctrine. The result of the election, by the popular vote, was for Lincoln and Hamlin, 1,857,610; for Douglas and Johnson, 1,365,976; for Breckenridge and Lane, 847,953; and for Bell and Everett, 590,631. The result by the college of electors, however, was very different. By this Messrs. Lincoln and Hamlin received 180 votes; Messrs. Breckenridge and Lane, 72; Messrs. Bell and Everett, 39; Messrs. Douglas and Johnson received 12 only.

The great events of 1861 followed in rapid succession. Mr. Douglas was spared their full development. He died, after a short illness, at his residence in Chicago, June 3, 1861.

Douglas Island: an island of Southeastern Alaska, celebrated for its gold mines. It is N. of Admiralty island and opposite Juneau, in lat. 58° 20′ N., lon. 134° 30′ E.; is about 20 miles long by 10 broad, separated from the mainland by a very narrow strait, and is nearly opposite the mouth of Taku inlet. The Treadwell gold mine on this island is the best-known mine in Alaska. It works a pyritic ore which is very easily reached, and though yielding only $4 per ton gives a good profit.

Douglass, David Bates: civil and military engineer; b. at Pompton, N. J., Mar. 21, 1790; graduated at Yale College Sept. 18, 1813, and Oct. 1, 1813, was appointed a second lieutenant in the corps of engineers U. S. army, and was promoted to first lieutenant in the following year for his services in the operations around Niagara and Fort Erie. He resigned his position in the army Mar. 1, 1831, to become the chief engineer of the Morris Canal Company; was one of the engineers of the Croton aqueduct 1833–35; and chief engineer of Greenwood Cemetery 1837–40. He was president of Kenyon College, Ohio, from 1840 till 1844, when he returned to New York, and was engaged till 1848 in important engineering work. In 1848 he became Professor of Mathematics at Hobart College, Geneva, and retained the position for the rest of his life. D. at Geneva, N. Y., Oct. 9, 1849.

Douglass, Frederick: orator; b. at Tuckahoe, near Easton, Md., in Feb., 1817; son of a white man and a negro woman who was a slave; at ten years of age sent to Baltimore to live with a relative of his master, Col. Lloyd; found employment in a ship-yard, and learned to read and write; escaped to New Bedford, Mass., in 1838; changed his name from Lloyd to Douglass; became agent of the Massachusetts Anti-Slavery Society, and lectured in New England and Great Britain; edited at Rochester, N. Y., a weekly journal, *The North Star*; lectured frequently before lyceums; in 1870 became editor of the *New National Era*; in 1871 as-

sistant secretary to the commission to Santo Domingo; in 1872 first in the list of presidential electors chosen by the Republican party of the State of New York; U. S. marshal District of Columbia, 1877–81; recorder of deeds in same District 1881–86; U. S. minister resident and consul-general at Haiti 1889–91. D. in Washington, Feb. 20, 1895. He published *Narrative of My Experience in Slavery* (Boston, 1844); *My Bondage and My Freedom* (Rochester, 1855); *Life and Times of Frederick Douglass* (Hartford, 1881).

Douglass, John Hancock, M. D.: b. in Waterford, N. Y., in 1827; graduated at Williams College 1843; in the medical department University of Pennsylvania 1847; studied two years in Europe; editor of the *American Medical Monthly* (1856–62); *New York Medical Journal* (1865–66); served with U. S. Sanitary Commission during the war and became its secretary. He was the leading physician in attendance on Gen. Grant in his last illness. D. Oct. 2, 1892.

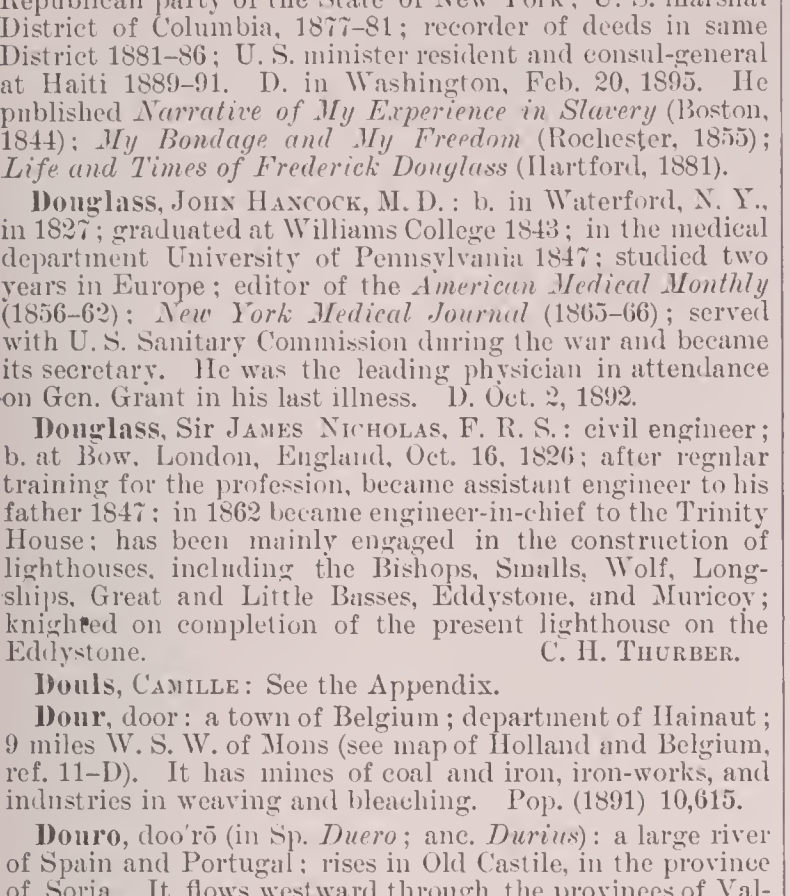
Douglass, Sir James Nicholas, F. R. S.: civil engineer; b. at Bow, London, England, Oct. 16, 1826; after regular training for the profession, became assistant engineer to his father 1847; in 1862 became engineer-in-chief to the Trinity House; has been mainly engaged in the construction of lighthouses, including the Bishops, Smalls, Wolf, Longships, Great and Little Basses, Eddystone, and Muricoy; knighted on completion of the present lighthouse on the Eddystone. C. H. Thurber.

Douls, Camille: See the Appendix.

Dour, door: a town of Belgium; department of Hainaut; 9 miles W. S. W. of Mons (see map of Holland and Belgium, ref. 11–D). It has mines of coal and iron, iron-works, and industries in weaving and bleaching. Pop. (1891) 10,615.

Douro, doo'rō (in Sp. *Duero*; anc. *Durius*): a large river of Spain and Portugal; rises in Old Castile, in the province of Soria. It flows westward through the provinces of Valladolid and Zamora until it touches the northeast extremity of Portugal. It then runs southwestward, and forms part of the boundary between Spain and Portugal. Resuming a westward direction, it traverses the northern part of Portugal, and enters the Atlantic 3 miles below Oporto. Its total length is nearly 500 miles. Rocks, sandbanks, and the rapid current render its navigation difficult. In Spain it is a narrow but deep river, pressed in between precipitous banks. But, in spite of its unequal fall, it could easily be made navigable on account of the great mass of water it carries. In Portugal it is a stately stream, forming a large lake-like basin just before disemboguing. Its mouth is narrow, however, and somewhat embarrassed by sand. Of its many affluents the Pisuerga is the most important.

Douroucouli, door-roo-koo'lē: the common name of several species of small, nocturnal monkeys, found from



The douroucouli, or the night monkey.

Central America to Southern Brazil. The most common species (*Nyctipithecus trivirgatus*), from Guiana and Brazil, has a short muzzle, large round eyes, and long, soft fur. It is a little over 2 feet in total length, of a silvery-gray color, light chestnut below and on the inner side of the limbs, with three black marks on the face. The douroucouli is dull and sluggish by day, but active at night, when it emerges from the hollow tree that forms its home, to pilfer birds' eggs, gather fruit, and catch insects, these last forming the bulk of its diet. F. A. Lucas.

Douven, dow'ven, or doo'ven, Jan Francis: portrait-painter; b. at Roermond, Holland, Mar. 2, 1656; studied under Gabriel Lambertin at Liège, and in 1684 settled at Düsseldorf, at the court of the Duke of Neuburg. He visited Vienna, Madrid, and other cities for the purpose of painting the portraits of sovereigns and other noble personages, and executed so many works of this kind that he is well styled the court-painter of Europe of that time. D. in Prague in 1710.

Douville, doo'veel', Jean Baptiste: traveler; b. at Hambye, department of Manche, France, Feb. 15, 1794; inherited a fortune which enabled him to travel extensively in Asia and America; in 1832 published at Paris a work in three volumes describing his explorations and discoveries in the interior of Africa. The Société de Géographie awarded him a gold medal, the Royal Geographical Society of London made him an honorary member, and the French maps and text-books were altered in accordance with his publication. He was soon exposed as an impostor, who at the time of his supposed explorations was teaching languages in England. He again visited South America, and was murdered there in 1835.

Dove [O. Eng. *dūfe*: Germ. *Taube*; origin doubtful]: in Christian art, a symbol of purity and an emblem of the Holy Spirit. Issuing from the lips of dying saints and martyrs, it represents the soul purified by suffering. Holding in its mouth an olive branch, it is the emblem of peace. In Catholic churches the pyx or ciborium containing the host is sometimes in the form of a dove. It is mentioned more than fifty times in the Bible. It was the only bird which could be offered as a sacrifice among the Jews, and, as it was cheap, it was often selected for that purpose by poor people. In order to supply the demand, the raising of doves was from early times a pursuit among the Jews, and the dealers had their stalls on the premises of the temple.

Dove, in ornithology: See Pigeon.

Do've, Heinrich Wilhelm: physicist; b. at Liegnitz, Silesia, Oct. 6, 1803; graduated at the University of Berlin in 1826. He became Professor of Physics there in 1829, and made researches into the laws of climate and atmospheric phenomena. He published, besides other works on meteorology, electricity, etc., *Meteorologische Untersuchungen* (Meteorological Researches, 1837); *Verbreitung der Wärme auf der Oberfläche der Erde* (The Diffusion of Heat on the Earth's Surface, 1852; published in 1853 by the British Association); *Gesetz der Stürme* (The Law of Storms, 4th ed. 1874). D. Apr. 4, 1879.

Dove, Richard Wilhelm: jurist; son of Heinrich Wilhelm Dove; b. in Berlin, Prussia, Feb. 27, 1833; studied in Berlin and in Heidelberg; became in 1859 privat docent at the University of Berlin; in 1862 professor at the University of Tübingen; in 1865 at Kiel; and in 1868 at Göttingen. In 1871 he was elected to the German Reichsrath, where he voted with the National Liberal party. He began in 1860 the publication of the *Zeitschrift für Kirchenrecht*, the leading periodical in Europe on all questions relating to church law.

Dovekie, or **Sea Dove**: the popular name for one of the small auks (*Alle alle*), a bird about 8 inches long. The head, neck, and upper parts are black, the under parts white. In winter the white extends to the bill and upon the sides of the neck. The dovekie is found in northern latitudes on both sides of the Atlantic, and during summer occurs in myriads at its breeding-places on the shores of Greenland and the adjacent islands. In winter it frequents the open ocean, and during storms is frequently blown inshore, occasionally inland. See Auk. F. A. Lucas.

Do'ver (anc. *Dubris*): city and seaport of Kent, England; situated on Dover Strait, 66 miles E. S. E. of London and 26 miles from Calais, France (see map of England, ref. 13–L). It is the point in England nearest to the Continent, and is the terminus of the Southeastern Railway. It stands at the entrance of a deep depression in an amphitheater of chalk-hills and cliffs. This city is defended by Dover

Castle, which is built on chalk-cliffs 320 feet high, and is a fortress of great strength and extent. This castle is said to have been founded by the ancient Romans. Dover contains a custom-house, a town-hall, a theater, and a military hospital. The harbor is protected by a stone pier built of solid masonry, 60 feet wide, and extending about 1,800 feet into the sea. Dover is the chief port of communication between England and France, and is only 21 miles distant from the nearest part of the Continent. Steamers ply daily between this port and Boulogne and Calais. Dover returns a member to Parliament, and is one of the Cinque Ports. A submarine cable was laid from Dover to Calais in 1850. With respect to its physical condition, the place is one of the healthiest in England, and the agreeable variation of open downs and steep cliffs in the surroundings makes it a favorite summer resort. Pop. (1891) 33,418.

Dover: capital of Delaware and of Kent County (for location of county, see map of Delaware, ref. 4–N); on St. Jones river and on railway; 48 miles S. of Wilmington and about 5 miles W. of Delaware Bay. It stands on high ground, the streets are wide, well shaded, straight, and cross each other at right angles, and most of the buildings are built of brick. The principal buildings face an open square planted with fine elms. It has 10 churches, an excellent public school, 3 select schools, the Conference Academy, a State-house, with a State library containing 50,000 volumes, a fine U. S. post-office building, a job-printing office, 2 fruit-

State capitol, Dover, Del.

packing houses, 4 fruit-evaporating houses, flouring-mill, sash and fruit-crate factory, foundry, machine-shop, carriage-manufactory, stocking-factory, gas-works, and the Holly system of water-works. It is the center of a great fruit-growing section. The town was settled in 1687, and was incorporated about 1720. Its first church (Protestant Episcopal) was completed in 1708. Dover became the capital of the State at the time of the outbreak of the Revolutionary war. A handsome monument commemorates the patriotic services of John Haslett, M. D., colonel of one of the Delaware regiments during the Revolution, who fell at the battle of Princeton. Pop. (1880) 2,811; (1890) 3,061; (1900) 3,329.

EDITOR OF "DELAWAREAN."

Dover: city and railway center; capital of Strafford co., N. H. (for location of county, see map of New Hampshire, ref. 8–G); situated on Cocheco river: 68 miles N. of Boston and 10 miles N. W. of Portsmouth. It is at the head of sloop navigation and at the lower falls of the river, 32 feet high, affording abundant water-power; the city has twelve churches, high school, private academy, a State library of 16,000 volumes, several large cotton-mills, extensive print-works, a large number of brick-yards, belt-factory, and manufactures of woolen cloths and flannels, shoes, machinery, etc., electric railway 4 miles in length, and a costly system of water-works. The Dover Navigation Company has a fleet of fifteen schooners, and the amount shipped from this port is very large. Dover was founded in 1623, and is the oldest town in the State. Pop. (1880) 11,687: (1890) 12,790; (1900) 13,207.

EDITOR OF "REPUBLICAN."

Dover: town; on railway; Morris co., N. J. (for location of county, see map of New Jersey, ref. 2–D); on the Morris Canal, and on Rockaway river. It has several iron-forges, iron-foundries, steel-works, spike-factories, and rolling-mills. Pop. (1880) 2,958; (1900) 5,938.

Dover: town; capital of Stewart co., Tenn. (for location of county, see map of Tennessee, ref. 5–D); on the Cumberland river; 75 miles W. by N. from Nashville and a mile E. of Fort Donelson. A national cemetery is situated a quarter of a mile W. of Dover. Pop. (1880) 317; (1890) not given in census; (1900) 400.

Dover's Powder [named from its inventor, Dr. Dover, an English physician]: a sudorific composed of ipecacuanha and opium, 1 part each, with sugar 8 parts, rubbed together to a very fine powder. Where the brain is unaffected and the tongue and skin moist it is of great service. Its composition now differs considerably from that given in Dover's formula.

Dover, Strait of (in Fr. *Pas-de-Calais*; Lat. *Fretum Gallicum*): the strait which separates England from France, and connects the English Channel with the North Sea. It is about 20 miles wide at the narrowest part. The depth varies from 6 to 29 fathoms. The English side of the strait is bordered by chalk-cliffs, some of which are about 600 feet high. Chalk-cliffs also occur on the French shore. It has been proposed to unite England with the Continent by way of the Straits of Dover or the channel by a bridge, a tubular railway, or a tunnel, but all these schemes have met with Government opposition.

Dov'refield: a mountainous plateau in Norway, forming the northern end of the central mass of the Scandinavian system. It extends along the north side of the Rauma valley, which separates it from Langfjeld plateau, to the sources of the Lougen, and thence N. E. to those of the Glommen. Its highest peak is the Sneehaettan, 7,613 English feet, formerly considered the highest in Scandinavia.

Dow, dow, or **Douw**, GERARD: painter; b. at Leyden, Holland, Apr. 17, 1613; a pupil of Rembrandt. He excelled in chiaroscuro and in technical skill, and finished his works with excessive delicacy. Among his works, which are small in dimensions, are *The Charlatan*; *The Dropsical Woman*; *The Dentist*; and *The Village Grocer*. D. in Feb., 1675.

Dow, LORENZO: clergyman; b. in Coventry, Conn., Oct. 16, 1777; received a meager education; admitted to the Connecticut (Methodist) Conference 1798. He soon dropped his official relations with that body, and went to Ireland to preach against Romanism. Immense crowds listened to him, attracted by his eloquence, his eccentricity, and his evident sincerity. Returning to the U. S. he directed his efforts against the Jesuits, preaching mostly in the South. Here, too, he attracted great congregations, despite the prejudices excited by his increasing eccentricity. He published *Polemical Works*; *The Stranger in Charleston, or the Trial and Confession of Lorenzo Dow*; *History of a Cosmopolite, or the Writings of the Rev. Lorenzo Dow, containing his Experiences and Travels in Europe and America up to near his Fiftieth Year*, etc. D. in Georgetown, D. C., Feb. 2, 1834.

Dow, NEAL: temperance reformer; b. in Portland, Me., Mar. 20, 1804; educated in Portland and New Bedford; was very early interested in the temperance cause; while mayor of Portland, 1851, drafted a bill to prohibit the manufacture and sale of intoxicating liquors; took the bill to the Legislature then in session at Augusta; had a public hearing before a special committee which voted to report the bill exactly as presented. It was printed that night, and the following day, May 30, was passed by both houses. That act became widely known as the "Maine Law." During the civil war he was colonel of the Thirteenth Maine Volunteers, and afterward brigadier-general. He was the Prohibitionist candidate for President in 1880. D. at Portland, Oct. 2, 1897. C. H. T.

Dowager: a widow endowed—that is, who either enjoys a dower from her deceased husband, or has property of her own brought by her to her husband on marriage, and settled on herself after his decease. In Great Britain the term is used in a less technical sense to distinguish the widow from the wife of her husband's heir of the same name and title, thus the dowager duchess, dowager countess, etc. No man can marry a queen-dowager without special license

from the sovereign on pain of forfeiting his land or goods. A queen-dowager does not lose her regal title when she marries a subject. Revised by F. Sturges Allen.

Dowagiac: city; Cass co., Mich. (for location of county, see map of Michigan, ref. 8–H); situated on the Michigan Central Railroad and on the Dowagiac river; 103 miles E. of Chicago; has 8 churches, 2 schools, and manufactures of stoves, agricultural implements, flour, and feed. Pop. (1880) 2,100; (1890) 2,086; (1900) 4,151. Editor of "Republican."

Dowden, Edward, LL. D.: Anglo-Irish scholar and author; b. in Cork in 1843. Since 1867 he has been Professor of English Literature in the University of Dublin. Author of several volumes of Shaksperean studies, of lives of *Southey* (1880) and *Shelley* (1886); *Studies in Literature* (1878); *Transcripts and Studies* (1888), etc.; in 1888 succeeded Prof. Müller as president of the English Goethe Society. He is secretary to the Liberal Union of Ireland. Commissioner of National Education, Ireland, 1896. Lectured in the U. S. in 1896.

Dower [O. Fr. *doaire* (> Mod. Fr. *douaire*) < Lat. **dotarium*, deriv. of *dos*, *dotis*, dower]: in the common law of England, an estate for life which a widow has in one-third part of all the lands and tenements of which her husband was seized beneficially, or of an estate of inheritance at any time during the marriage.

1. *The Nature of the Estate.*—Dower passes through three stages. While the husband lives it is but an inchoate right and incapable of enforcement. Should the husband sell to a stranger and leave her destitute, she would have no claim to the land while the husband lived. On her husband's death, and before dower is assigned, she has a right of action. After dower is assigned she has an estate in the land. The rights of dower depend upon a rule of law which is founded on public policy. The law of the place where the land is situated governs it.

2. *The Requisites of Dower.*—These are threefold—marriage, seizin of the husband, and his death. The leading questions on this subject concern seizin. By this is meant beneficial ownership of a present estate of freehold, which may descend to the husband's heirs. There can be no dower in an estate for years, however long it may last. Nor can there be in a reversionary estate which is preceded by a prior estate of freehold or for life owned by another person, though there may be where the prior estate is for years. The widow of a trustee can not be endowed, as he is not a beneficial owner. This proposition would be applied to the widow of a deceased partner, who could only be endowed subject to the adjustment of the affairs of the partnership. Formerly the trust estate itself was not the subject of dower. This rule does not prevail in the U. S., and dower may sometimes be had in money, which by the doctrine of equitable conversion is treated as land. Whenever the husband's estate is defeated by a superior title, dower falls with it.

3. *Assignment of Dower.*—As dower is one-third part of the husband's estate, it must be assigned either by the parties or by act of the law. Certain legal rules must regularly be followed, when dower is said to be assigned of common right. These may be relaxed by agreement under seal, when the assignment is said to be against common right.

4. *Barring of Dower.*—The right can not be destroyed by the mere act of the husband. Creditors also take subject to this claim. It can in general be barred only by the wife's own act, as by joining in a conveyance with the husband, or by a jointure settled before marriage. The husband often in his will, either expressly or by implication, gives his wife property in lieu of dower. In this case she may, after his death, elect to take such property or her dower, but can not take both.

This right occasioned much inconvenience in England by impeding the conveyance of property. For this reason, by the Dower Act of Aug. 29, 1833, the right of dower was virtually placed entirely in the hands of the husband in the case of all marriages contracted after Jan. 1, 1834. The husband may now dispose of his lands by will or otherwise, free from any claim of dower on the part of his wife. If, however, he dies intestate, his widow, under the statute of distribution, receives not merely for life, but absolutely, one-third of his personal estate. In the U. S. the general rules of the English common law still prevail. As a general rule, also at least one-third of the husband's personal estate is given to the wife, as by the English statute of distribution.

T. W. Dwight.

Dowlais: an outlying district of Merthyr Tydvil, Wales, noted for its large iron and steel works.

Dow'latabad: a fortified and decayed town of Hindustan; in the Nizam's Dominions; 10 miles W. of Aurungabad (see map of South India, ref. 2–D). It is defended by a rock-fortress which occupies the summit of an isolated rock about 500 feet high. The lowest third of this rock is perpendicular, so that the summit is accessible only by a passage excavated in the interior. Near this town are the cave-temples of Elora.

Dowling, John, D. D.: clergyman and author; b. in Pevensey, Sussex, England, May 12, 1807; became a resident of the U. S. in 1832, and an eminently successful writer and Baptist preacher of New York city. He published a *Defense of the Protestant Scriptures* (New York, 1843); *History of Romanism* (1845); and other works. D. in Middletown, N. Y., July 4, 1878.

Down: a county in the northeastern part of Ireland, in Ulster; bounded N. by Antrim and Belfast Lough, E. and S. E. by the Irish Sea, and W. by Armagh. Area, 957 sq. miles. The chief rivers are the Bann and the Lagan. The surface is mostly hilly or undulating, and the southern part is occupied by the Mourne Mountains, the highest peak of which is 2,796 feet high. The soil of many parts is fertile. The chief articles of export are linen fabrics, hosiery, grain, butter, pork, and hides. The fisheries of this county are important, though they are very far from being fully developed. Capital, Downpatrick. Pop. (1881) 272,207; (1891) 266,893.

Downcast: in mines, the shaft through which air for ventilation descends, the impure air ascending through another shaft, the "upcast," at the bottom of which a fire is kept up. In other mines various forms of fans are used to secure ventilation.

Downie, David, M. A., D. D.: missionary; b. in Glasgow, Scotland, July 29, 1838; emigrated to the U. S. in 1852; graduated at Phillips Andover Academy 1865, at Brown University 1869, and at Rochester Theological Seminary 1872; appointed missionary of the American Baptist Missionary Union in 1873, and went to Nellore, India. During his ministry the number of missionary stations has increased to fourteen, and the number of communicants from 1,500 to 80,000. He has published *The History of the Telugu Mission* (Philadelphia, 1893).

Downieville Butte: a mountain-peak in Sierra co., Cal.; about 12 miles E. N. E. of Downieville. Altitude about 8,800 feet above the sea.

Downing Street: a short street in Westminster, London, England, where the colonial and foreign offices and the official residence of the Premier are located. As the place of the cabinet's meetings it has become closely identified with the policy of the ministry, and the name is sometimes used to signify the Government. The street was named from Sir George Downing, Secretary to the Treasury in 1667.

Downingtown: borough and railway junction; Chester co., Pa. (for location of county, see map of Pennsylvania, ref. 6–I); in Chester valley; 32 miles W. of Philadelphia. It has a young ladies' academy, the Chester Valley Academy for young men and boys, a limestone quarry, manufactures of carriages, shoes, paper, woolen goods, stoves, and machinery, water-works, etc. Pop. (1890) 1,920; (1900) 2,133.

Downpat'rick: a seaport of Ireland; capital of the county of Down; near the mouth of the Quoyle (which enters Lough Strangford); 21 miles S. S. E. of Belfast (see map of Ireland, ref. 6–J). It has a cathedral, a hospital, and manufactures of sewed muslin, linen, soap, and leather. It is said to be the oldest city in Ireland, and was burned by Edward Bruce in 1315. The see of Down was united with that of Connor in 1442, and with that of Dromore in 1842. Pop. 3,400.

Downs, The: two broad ridges of undulating chalk-hills S. of the Thames river in England. They extend from the middle of Hampshire eastward; the North Downs through Surrey and Kent to Dover, and the South Downs through the southeastern part of Hampshire to Beachy Head. Between the two ridges, the former of which is nearly 120 miles long, lies the valley of the Weald, from which the chalk strata have been removed by denudation. Toward the Weald the ridge sides are somewhat steep, constituting the "chalk escarpment," and the outward slopes are relatively gentle.

The ridges are characterized by the absence of streams, even in time of rain, the porous chalk absorbing the water as it falls. For the same reason they are not adapted to tillage, and contain no villages, but they produce fine aromatic grass, and are the home of the famous Southdown sheep.

Revised by G. K. G.

Downs, The: a portion of the North Sea off the southeast coast of Kent, England, between the North and South Forelands; important as a shelter for shipping, which is protected by the Goodwin Sands, a natural breakwater. This large natural harbor of refuge is 8 miles long and 6 miles wide, having an anchorage which varies from 4 to 12 fathoms in depth. It is safe except during a south wind. In time of war it is a place of rendezvous for the royal navy.

Downshire, Marquesses of (1789): Earls of Hillsborough (1751), Viscounts Hillsborough (1717), Viscounts Kilwarlin (1751), Barons Hill (Ireland, 1717), Earls of Hillsborough and Viscounts Fairford (1772), and Barons Harwich (Great Britain, 1756).—Arthur Wills John Wellington Blundell Trumbull Sandys Roden Hill, sixth marquess, b. July 2, 1871; succeeded his father Mar. 31, 1874.

Dowry [for *dowery*, an extended form of Dower (*q. v.*)]: in law, the marriage portion brought by a wife to her husband. This term is often confounded with *dower*, but has a different signification.

Doxology [from Gr. δοξολογία; δόξα, praise + λέγειν, speak]: a form of praise said or sung in divine service, commonly at the close of a prayer. The Great Doxology, as it is called, is an expansion of the angelic hymn, and is sung in the Roman Catholic Church at the celebration of the Eucharist. It begins with the words "Gloria in excelsis Deo." The Lesser Doxology is the "Gloria Patri," the substance of which appears in the metrical doxologies in use among Protestants generally.

Doyen, Gabriel François: artist; b. in Paris, 1726; studied under Carl Vanloo, and gained the great prize in 1746. After seven years' study in Italy, he returned to Paris in 1753. His pictures attracted very little attention; they were even condemned. But he was too proud to yield to the bad taste reigning. He concentrated all his powers on the magnificent picture *La Mort de Virginie*, and it took the public by storm. His masterpiece, however, is *Le Miracle des Ardents* in the Church of St. Roch, in Paris (1773). In 1791 he removed to St. Petersburg, as director of its academy of art. D. in St. Petersburg, June 5, 1806.

Doyle, Richard: illustrator and caricaturist; b. in London in 1826. He was one of the staff of *Punch*, founded in 1841, and designed the cover of that paper, which has never been changed; but he left *Punch* in 1851, because of the attacks of that paper on the new Roman Catholic hierarchy in England. He illustrated many books, such as Thackeray's *Newcomes*; and published some collections of his work in *Punch*, such as *Manners and Customs of ye Englishe*; other humorous stories, chiefly told in pictures, such as *The Foreign Tour of Messrs. Brown, Jones, and Robinson*; and some charming books of fairy-land illustrations. D. in London, Dec. 11, 1883.

Russell Sturgis.

Doylestown: borough (incorporated in 1835); capital of Bucks co., Pa. (for location of county, see map of Pennsylvania, ref. 5–J); terminus of Doylestown Branch of Phil. and Reading R. R.; 32 miles by rail N. of Philadelphia; has a public library founded in 1856, graded public school and private seminary, spoke-factory, agricultural-machine works, water-works, gas-works, and electric lights. It is much frequented by summer visitors from Philadelphia. Pop. (1880) 2,070; (1890) 2,519; (1900) 3,034.

Editor of "Democrat."

Dózy, Reinhart: Semitist; b. at Leyden, Holland, Feb. 21, 1820; graduated at the University of Leyden in 1844. In 1850 he became Professor of History at Leyden. Most of his works are contributions to the history of the Moslems in Spain and North Africa. Especially important are *Recherches sur l'Histoire et la Littérature de l'Espagne pendant le Moyen Âge* (3d ed. 2 vols., Paris, 1881); *Histoire des Musulmans d'Espagne*, a book of extraordinary charm (Paris, 1861 and 1881); *Glossaire des mots espagnols et portugais dérivés de l'arabe* (2d ed. Leyden, 1869). C. H. Toy.

Draa Wadi: the longest river of Morocco, though some others contain a greater volume of water. Rising in the Atlas Mountains of Central Morocco, it flows S. to the boundary, which it then follows through the Western Sahara till it reaches the Atlantic at Cape Nun. It is the only river of the Western Sahara that has a constant flow of water, and it forms a natural boundary between the nomads of the desert and the settled tribes of South Morocco. Its banks and bed are of light alluvium, capable of great fertility if cultivated. The river is not navigable. C. C. Adams.

Dracæ'na dra'co, or **Dragon-tree**: a tree belonging to the family *Liliaceæ*, some examples of which grow to prodigious size in the Canaries and India. The height is not proportioned to the thickness of the stem, and the head is crowned with short branches having tufts of sword-shaped leaves. It produces a part of the resin called Dragon's Blood (*q. v.*). A specimen in the island of Teneriffe was described by Humboldt as having a stem about 45 feet in circumference in 1799. It had the same measurement in 1402. It was worshiped by the Guanches, and its hollow trunk was converted by their conquerors into a chapel. This extremely old tree was overthrown in 1868.

Drachenfels, draa'chen-fels (i. e. dragon's rock): a mountain-peak in Rhenish Prussia, on the Rhine; about 8 miles S. E. of Bonn; 1,056 feet high. It rises abruptly from the river, and is renowned in Byron's verses commencing—

> The castled crag of Drachenfels
> Frowns o'er the wide and winding Rhine.

Its summit, crowned by a ruined castle, commands a beautiful prospect.

Drachm, or **Dram** [from Gr. δραχμή; in Fr. *drachme*; Lat. *drachma*]: a measure of weight. The avoirdupois drachm is one-sixteenth part of an avoirdupois ounce; the apothecaries' drachm is the eighth part of a troy ounce. The orthography *dram* is commonly employed in avoirdupois weight, and *drachm* in apothecaries' weight. In apothecaries' measure a fluid drachm is one-eighth of a fluid ounce.

Drachma: a silver coin, the unit of the monetary system of ancient Greece. The Athenian drachma was equivalent to six oboli, or nearly twenty cents, and weighed from sixty-three to sixty-six grains. Other Greek states had drachmas of different values.

Drachmann, draak'man, Holger Henrik Herholdt: Danish poet; b. in Copenhagen, Oct. 9, 1846. In his youth he studied art and won some reputation as a marine painter. In 1872 he published a volume of poems (*Digte*), and another of sketches (*Med Kul og Kridt*), and since that time he has made literature his profession, producing with astonishing fecundity lyrics, narrative poems, dramas, novels, tales, etc. His best work is his lyric verse, which takes rank with the best in Danish literature, and his sketches of the life of fishermen and sailors (cf. Blicher). Drachmann is the most eminent of the Danish writers that have been influenced by Georg Brandes (*q. v.*) and follow what is called the new direction. (See Danish Literature, *Latest Period.*) At the beginning of his career he was intensely radical, but his sentiments have undergone some modifications. He has traveled much and made himself intimately acquainted with the life of many conditions of men. The restlessness of the last part of the nineteenth century is in him combined with a remarkable poetic genius, which, though manifesting itself in very different degrees in his various works, has already given them the position of classics. Of his numerous publications the following may be mentioned: *I Storm og Stille* (1874); *En Overkomplet* (1876); *Ungt Blod* (1877); *Sange ved Havet* (1877); *Tannhäuser* (1877); *Paa Sømands Tro og Love* (1878); *Derovre fra Grænsen* (1877); *Prinsessen og det halve Kongerige* (1878); *Ranker og Roser* (1879); *Ungdom i Digt og Sang* (1879); *Østen for Sol og Vesten for Maane* (1880); *Vandenes Datter* (1881); *Strandby Folk* (1883); *Der var en Gang* (2d ed. 1887); *Alkibiades* (1886); *To dramatiske Digte* (1888); *Troldtøj* (1889 ff.); *Tusind og en Nat* (1889); *Forskrevet* (1890); *Tarvis* (1891).

G. L. Kittredge.

Draco, or **The Dragon**: a constellation near and around the north celestial pole. It was from observations upon the star γ Draconis that Bradley was led to his brilliant discovery of the aberration of light.

Draco (in Gr. Δράκων): a Greek grammarian of Stratonicea, in Caria, of whose life few traces are found, but who flourished probably about 125 A. D. Suidas and Eudocia assign to Draco a great number of works on grammar, on meter, and on the poems of Pindar and Alcæus, all of which have perished, with one exception, a treatise on Greek meters

(περὶ μέτρων ποιητικῶν), which Hermann considers an epitome of Draco's work, with numerous interpolations from other quarters by a later hand. This was edited by Hermann (Leipzig, 1812).

Dra'co, or **Dra'con** (in Gr. Δράκων): an Athenian legislator who was archon in 621 B. C., and was the author or compiler of the first written laws among the Athenians. Judged by the standard of a more humane age, this code was extremely harsh, the death penalty, according to Plutarch, being inflicted for every offense, but of the code itself not a line has come down to us, and tradition has undoubtedly exaggerated its cruelty, while, if it be taken in connection with the rude state of society at the time, it will appear a distinct advance in the judicial system. It remained in force until the time of Solon, who substituted milder penalties. The term *draconic* is sometimes applied to laws which are excessively severe.

Dracon'tium [from Gr. δρακόντιον, literally a little dragon, from some supposed fanciful likeness to a dragon]: a genus of plants of the natural family *Araceæ*. The *Dracontium polyphyllum*, a native of Guiana, India, and Japan, has a powerful action on the nervous system, and is used as a remedy for asthma. The flower emits an intolerable stench when it first opens. The *Dracontium* of the U. S. Pharmacopœia is the skunk-cabbage (*Symplocarpus fœtidus*), which has similar medical properties. It is kindred to the true *Dracontium*, and like it has a strong offensive odor.

Dracon'tius, Blossius Æmilius: advocate in Carthage; flourished in the latter half of the fifth century; was a writer of poetry of considerable merit. Besides several epyllia on mythical subjects, two epithalamia, and an elegiac poem called *Satisfactio*, addressed to Gunthamund, King of the Vandals (484–496), by whom he had been imprisoned, he wrote a didactic poem in three books entitled *Laudes dei*, a part of which (the Hexæmeron), containing an account of the six days of creation, was edited separately, and is praised by Isidorus. In the seventh century Eugenius, Bishop of Toledo, added to it an account of the seventh day. Dracontius shows a surprising familiarity with classical writers, and his manner is very rhetorical. On account of the resemblances in diction and meter, the poem known as *Orestis tragœdia* is now generally ascribed to Dracontius. See edition of the *Carmina minora* by F. de Duhn (Leipzig, 1873). M. Warren.

Draft: a bill of exchange; an order for the payment of money drawn by one person upon another; also a tentative copy of a legal document or other formal writing made for the purpose of adjusting the matter which is to be admitted into the fair copy. See Bill of Exchange.

Draft Riots: certain outbreaks that occurred in the streets of New York city, July 13–17, 1863, occasioned by the first draft under the Enrollment Act of Apr. 16, 1862, which provided for the enrollment by provost marshals and enrolling officers of all able-bodied males between the ages of eighteen and forty-five to be chosen by lot. The draft was held by many to be not only unconstitutional in itself but most unfair in its working on account of the excessive quota required of the urban districts. Moreover, the clause permitting the purchase of exemption from service for the sum of $300 caused much dissatisfaction. Inflamed by the intemperate words of some of the newspapers and by the harangues of agitators, the mob, consisting chiefly of the poorer classes and those of foreign birth, burst into a house in the upper part of the city where the drawing was going on, drove out the clerks, destroyed the papers, and set fire to the building. Then followed a series of brutal outrages, which the police though efficient were powerless to prevent. Stores were plundered, buildings burned, and unoffending citizens murdered. The fury against the colored race showed itself in the murder of several Negroes and the burning of the Colored Orphan Asylum. The crowd, now swollen to thousands, encountered no serious opposition till the troops from the posts in the harbor gathered in the streets. From that time collisions were frequent, with the heavier losses on the side of the rioters, but for four days the tumult continued. The return of the militia from Pennsylvania and of some regiments of veterans from the Army of the Potomac restored order. The loss of property was severe, but the owners were in part indemnified by the payment of $1,500,000 by the city government. Gov. Seymour, sympathizing with the opposition to the draft, petitioned the President for its suspension until its constitutionality should be decided upon, and complained especially of the unfair apportionment, but President Lincoln, though willing to consider the question of a more equitable distribution, thought the matter too urgent to admit of delay. In the following month the draft was resumed in New York and completed without resistance. See Greeley, *American Conflict*.

F. M. Colby.

Drag'oman [deriv. of Gr. δραγούμανος < Ar. *tarjumān* > E. *tagum*]: in the Levant, an interpreter or guide for foreigners. The dragoman of the Sublime Porte is an important Turkish officer, who forms the medium of communication between his own Government and foreign ambassadors. The term is also applied to the interpreters attached to European embassies and consulates in the Levant. They are usually natives of Italian extraction. They and their families are not subject to the Turkish laws, but are under the protection of the embassies which they serve.

Dragon [deriv. of Gr. δράκων, a serpent, a dragon]: a small inoffensive East Indian lizard of the genus *Draco*, called winged dragon, or flying dragon (*Draco fimbriatus* and *volans*), remarkable for an expansion of the skin on each side, supported by the greatly elongated last six ribs, forming a kind of wing, which sustains the animal like a parachute; when not in use the ribs and fold of skin are folded along the body. Other species, the dragon lizards (*Ada*), belonging to the *Tejidæ*, are natives of South America only. They have the tongue forked like a serpent, back and tail crested, and are sometimes 6 feet long. They have no parachute; they are bold and resolute in self-defense.

Flying dragon: *Draco volans*.

Revised by F. A. L.

Drag'onet: any fish of the genus *Callionymus* and family *Gobiidæ* (goby family); found in the temperate seas of the Old World. There is no air-bladder; the ventral fins are larger than the pectorals and placed under the throat, and the gill-openings are reduced to a small hole on each side of the nape. One of the finest species is the gemmeous dragonet (*Callionymus lyra*), of a golden color, variegated with sapphire blue.

Dragon-fly (in Fr. *démoiselle*; Germ. *Stechfliege*): the popular name of the members of the families *Libellulidæ*, *Æschnidæ*, and *Agrionidæ*, which include an immense number of species of neuropterous insects. They have large globular heads, strong mandibles, eyes lateral, large, and projecting, antennæ short, four narrow, gauze-like wings,

Dragon-fly: *Agrion*.

strongly reticulated, and the abdomen often remarkably slender. They are found in northern countries, but they are most common in the warmer climates, and frequent marshes, lakes, and rivers. Their food is insects, which they devour with great voracity. They are sometimes known as "devil's darning-needles," and are often regarded by the ignorant with groundless dread.

Dragonnade, drăg-on-nād′: a persecution carried on with the aid of troops; specifically, one of a series of persecutions which the French Protestants suffered in the reign of Louis XIV.; so called because dragoons (in Fr. *dragons*) were employed as instruments of the persecution.

Louvois, the king's minister, is thought to have originated these measures, which were executed with great severity in 1684 and the years immediately succeeding the Revocation of the Edict of Nantes (1685). A body of dragoons led by a bishop and intendant marched through the provinces, requiring the Protestants to abjure their religion, and persecuting those who refused. Troops were quartered in Protestant households and allowed to subject the inmates to every kind of insult and injury, from which the only escape was conversion to the Roman Catholic faith. Such conversions accordingly took place in great numbers, but with questionable sincerity. See Perkins, *France under the Regency*; see also the article HUGUENOTS.

Dragon's Blood, or **Gum Dragon** (in Lat. *Sanguis draconis*): a resin obtained from various trees growing in warm climates. Among these are the DRACÆNA DRACO (*q. v.*), the red sandal-wood (*Pterocarpus santalinus*) of the East Indies, the *Pterocarpus draco*, a leguminous tree of South America, and the *Calamus draco*, an East Indian rattan palm. The dragon's blood of commerce is of a dark reddish-brown color, smooth, and brittle, and dissolves in oil, alcohol, and ether. The solution is used for staining leather, wood, and even marble. The resin is also an ingredient of some varnishes and lacquers. It comes from the Moluccas, Socotra, Brazil, and Teneriffe.

Dragoon: See CAVALRY.

Drainage: the removal of the excess of water from the soil, either by means of canals and open ditches or by underground sewers, pipes, and hollow tiles. No part of farm-husbandry pays a larger profit upon capital invested than the judicious drainage of land. In the U. S. there is very little ground that is not too wet in rainy weather and too dry in the frequent and long-continued droughts. Thorough drainage not only relieves the first-mentioned evil, but, strange as it at first appears, it greatly mitigates the bad effects of dry weather. When soil is drenched with water and dried by evaporation, it becomes hard, especially if it be argillaceous; land that is dried by drainage is porous and permeable to the dews and showers; while the soil deepened by drainage permits growing crops to put forth longer roots, and thus become secured against drought. Experiments in draining bogs have shown that when the water is given free passage through a cold soil by thorough drainage its temperature at the depth of 7 inches may be raised 10° above that of the adjoining undrained soil.

It appears also that good drainage diminishes the relative number of fevers, especially those of a malarial origin, while it is almost certain that excessive moisture in the soil is a fruitful cause of consumption. So important is this subject considered in Great Britain that Parliament in 1846 offered in the Drainage Act to advance money on easy terms to landholders for the purpose of improving the drainage of land. The act has proved a great blessing.

Underground drainage is the best for land that is not decidedly marshy; and of all underground drains those made with tiles (hollow cylinders of porous burned clay) are the most effective. The tiles should be laid near enough to the surface to effect a thorough drying after rains, and deep enough to escape the plow and frosts, and to afford "draught" from the soil above. From 3½ to 4 feet deep is considered the proper depth. The ideal drainage system places these tile drains at a distance apart of about 4 rods throughout the field. It is very important to avoid curves and angles in the vertical plane of drains, because any earth which may enter the tiles will be sure to lodge at depressed points.

Draining lakes and marshes is a matter requiring great capital and much engineering skill, but it is sure to become a very important question in the South and West of the U. S. In Holland, steam-pumps, wind-mills, and tide-gates are used extensively. The great Haarlemer-meer was drained and is kept drained by steam-power. See HAARLEM LAKE. For the drainage of cities, see SEWERAGE, and for house-drainage, see PLUMBING.

Revised by MANSFIELD MERRIMAN.

Drainage, in physical geography: See RIVERS and VALLEYS.

Drake, BENJAMIN M., D. D.: minister of the Methodist Episcopal Church South; b. in Robeson co., N. C., Sept. 11, 1800. He joined the Tennessee Conference in 1820, but the next year was transferred to the Mississippi Conference. He built the first Methodist church in New Orleans, was president of Elizabeth Female Academy, the first Methodist school established in Mississippi, 1828–32, and was president of Centenary College, Jackson, La., from 1854 till his death in Mississippi in 1860.

Drake, CHARLES DANIEL: jurist; a son of Dr. Daniel Drake, an eminent physician and writer on medical subjects; b. at Cincinnati, O., Apr. 11, 1811. He served as midshipman in the navy 1827–30, and was admitted to the Ohio bar in 1833. In 1834 he removed to St. Louis, where he became eminent as a lawyer and politician; was in 1864 vice-president of the convention which revised the constitution of Missouri; was U. S. Senator 1867–71, and was appointed chief justice of the U. S. court of claims in 1871, retiring in 1885. He was prominent in the councils of the Presbyterian Church; published *Law of Attachments* (1854) and *Life of Dr. Daniel Drake* (1871). D. Apr. 1, 1892.

Drake, Sir FRANCIS: English naval hero: b. probably at Tavistock, Devonshire, about 1540. Nothing is positively known of his early life. In 1567 he commanded a little vessel, the Judith, in the squadron of his kinsman, John Hawkins, which was seized and destroyed by the Spaniards, only the Judith and one other vessel escaping. He made voyages to the West Indies and the Spanish main (1570 and 1571), and in 1572 he left England with two vessels and seventy-three men, the object being to attack Nombre de Dios. As England was then nominally at peace with Spain, the enterprise was practically a freebooting expedition. Nombre de Dios was taken, and an immense amount of treasure was found; but Drake was wounded, his men became disheartened, and the town and treasure were abandoned (July 29, 1572). Later, Cartagena and Porto Bello were successfully attacked, many Spanish ships were taken, and a vast amount of silver was captured on the Isthmus of Panama, most of it being abandoned because the men were unable to carry it. Drake crossed the isthmus to Panama, and was the first Englishman to see the Pacific. In Dec., 1577, he started on another cruise with five vessels, as before without a royal commission. The object was to attack Spanish vessels off the Pacific coast of America. The squadron passed the Straits of Magellan safely, but shortly after one ship was lost and another turned back. With the rest Drake plundered Valparaiso and Callao (Jan. and Feb., 1579), captured a treasure ship with over $800,000, crossed the Pacific, and, after cruising among the Malay islands, returned to England by way of the Cape of Good Hope, Sept., 1580. Queen Elizabeth visited Drake on his ship and knighted him there, and thereafter he held important commands in the royal navy. In 1584–85 he was a member of Parliament. In 1585 he commanded an expedition to the West Indies and Virginia. Spain was preparing the great armada for the invasion of England. Early in 1587 Drake was sent with a strong fleet against the Spanish coast to "singe the King of Spain's beard," an operation which he conducted with his usual daring and success. Nearly 100 unfinished ships, intended for the armada, were sunk or burned at Cadiz and elsewhere, and a homeward-bound Portuguese East Indiaman was captured with a rich booty. In July, 1588, Drake commanded a division of the English fleet under Howard in the great fight with the Spanish armada. In 1595 he commanded another expedition to the West Indies, but died Jan. 28, 1596, as the fleet was approaching Porto Bello.

HERBERT H. SMITH.

Drake, FRANCIS SAMUEL: author; b. at Northwood, N. H., Feb. 22, 1828; son of the antiquary and historian, Samuel Gardner Drake. He published a valuable *Dictionary of American Biography* (1872); a volume of memorials for the Massachusetts Society of the Cincinnati; *Life of General Henry Knox* (1873); and *Indian History for Young Folks* (1885). D. in Washington, D. C., Feb. 22, 1885.

Drake, draa′ke, FRIEDRICH: sculptor; b. at Pyrmont, Germany, June 23, 1805; was a pupil of Rauch. He gained a high reputation by statues and busts of many eminent

Germans of his time, including the Humboldts and Oken, and two colossal statues of King Frederick William III. Among his other works is an allegorical group of the *Eight Provinces of Prussia* (1844), in the castle of Berlin; a remarkable colossal statue of his teacher, Rauch, for the new museum at Berlin; and an equestrian statue of King William I. of Prussia for the bridge over the Rhine at Cologne. D. Apr. 6, 1882.

Drake, Joseph Rodman: poet; b. in New York city, Aug. 7, 1795; studied medicine and took his degree in 1816; became an intimate friend of Fitz-Greene Halleck and James Fenimore Cooper. A volume of his poetical works, published in 1836, includes his longest imaginative poem, *The Culprit Fay*, written probably in 1819, and some spirited verses entitled *The American Flag*. D. in New York city, Sept. 21, 1820. H. A. B.

Drake, Samuel Gardner: antiquarian; b. at Pittsfield, N. H., Oct. 11, 1798. For many years a school-teacher in a country district, he removed in 1828 to Boston, where he opened an antiquarian bookstore, the first of its kind in the U. S. He was one of the founders of the New England Historical and Genealogical Society, and published, besides other works, *Indian Biography* (1832); *The Book of the Indians* (1833); *History and Antiquities of Boston* (1856); and *Annals of Witchcraft in the United States* (1869). D. in Boston, Mass., June 14, 1875.

Drakenberg, draa'ken-bĕrg (that is, *Dragon Mountain*), **Range**: the highest and longest portion of the series of mountain buttresses in South Africa running nearly parallel with the coast of the Indian Ocean and forming the divide between the river systems tributary to the Atlantic and those of the Indian Oceans. This sandstone range extends, under the name of the Drakenberg, from about 31° S. lat. to the southern boundary of the Transvaal at a mean distance from the sea of about 120 miles. Its southeast slopes, exposed to abundant rain, are greatly worn by denudation, and show many valleys and jagged peaks, some of which are imposing summits—e. g. Giant Castle, 9,657 feet; Champagne Castle, 10,357 feet; and Monts aux Sources, 10,000 feet. Presenting from the coast regions every appearance of a mountain-range, it largely loses this aspect when viewed from the plateau on the other side of the mountains, where the higher peaks alone rise impressively above the general level. C. C. Adams.

Drakenborch, draa'ken-bōrkh, Arnold, von: philologist; b. in Utrecht, Holland, Jan. 1, 1664; Professor of Classical Languages there; edited, with notes, an edition of *Livy* (17 vols., Stuttgart, 1828), which is still of great value. D. at Utrecht Jan. 16, 1748. A. G.

Dram: See Drachm.

Drama, draa'ma [Gr. δρᾶμα, action, deriv. of δρᾶν, do]: originally the exhibition of human actions (especially those which reveal the feelings and passions) upon the stage. The ancient Greek drama, comedy as well as tragedy, had its origin in the worship of Bacchus (Dionysus). The Dionysian dithyrambs sung at the festivals of Bacchus sometimes expressed wild and boisterous gayety, at other times passionate sorrow. From the former was at length developed the old Greek comedy, which may be said to have attained its highest perfection in the plays of Aristophanes (*q. v.*); from the latter arose the Greek tragedy, which found its most perfect expression in the immortal works of Æschylus, Sophocles, and Euripides.

The Roman drama was derived from the Greek, to which, in the opinion of all the most distinguished critics, it was much inferior. The most celebrated Roman dramatic poets, Plautus and Terence, appear to have taken Menander and Philemon (of the New Greek comedy) as their models, and their productions have exercised considerable influence on the modern comedy. In tragedy ancient Rome produced one truly great poet, Seneca.

The Hindu drama, quite independent of the drama of Europe in its origin, has produced some works of great merit, the most celebrated of which is the *Sakoontalâ, or the Lost Ring*, of Kâlidâsa (who is supposed to have lived about 50 B. C.)—a work which has received the highest commendation from some of the most eminent critics of modern Europe, and has been pronounced worthy of the genius of Shakspeare. This remarkable production, instead of being divided into five acts, like the classic and modern drama, consists of seven acts.

The Chinese also have a drama, but greatly differing in some respects from that of the Western nations; a single piece being often extended through no inconsiderable portions of several successive days.

In modern times the drama has been cultivated with success, it may be said, by all the principal European nations, but more especially by the Italians, the Spaniards, the French, the English, and the Germans. For a long period the French were generally supposed to surpass all other nations in the genius and skill of their dramatic writers, as well as in the admirable performance of their actors. The French critics usually insisted on the strictest adherence to the rules of the classic drama, and particularly to what are commonly termed "the three unities." Until the time of Lessing the German theater was scarcely more than a reflection of that of Paris, but that great author and critic taught his countrymen to throw off the trammels and affectations of a foreign school, and to give entire freedom to the cultivation of the national genius. Since that time the German authors, taking the English for their model rather than the French, but without servilely following any, have produced the finest dramatic works that have appeared in Europe since the time of Shakspeare. Among the German dramatic writers, Goethe and Schiller, by universal consent, occupy the foremost rank. Denmark has also produced some eminent dramatic writers, among whom Öhlenschläger (*q. v.*) is the most celebrated. Italy can scarcely be said to have produced any dramatic poets of the highest order; among her best are perhaps Goldoni in comedy, and Alfieri, Manzoni, and Silvio Pellico in tragedy. The Spanish drama has given to the world many productions displaying rare genius, but none that are worthy to be placed by the side of the greatest dramatic works of Greece, England, Germany, or France. The most celebrated names in Spanish dramatic literature are those of Lope de Vega and Calderon, the former surpassing all that is recorded in the history of the human mind in the marvelous fertility of his genius; the latter pre-eminent for the brilliancy of his imagination, as well as for the fertility of his invention, but neither of them producing any work of the highest order.

The French drama justly holds a high place in European literature. It is not too much to say that in comedy the writers of no other nation, either in ancient or modern times, have equaled the French. The best plays of Molière may be said to be not only unrivaled, but unapproached, by those of any other author, Shakspeare, Goethe, and Schiller excepted. In tragedy, Corneille, Racine, and Voltaire all exhibit genius of the highest order, but Racine, in the natural, graceful simplicity, as well as in the exquisite finish, of his productions is generally admitted to have approached most nearly to the best specimens of the ancient Greek tragedy.

Though the dramatic literature of England presents us with fewer writers of the highest order than that of France, the former can boast of one whose dramatic genius surpasses everything to be found in ancient or in modern times. While in his best comedies Shakspeare is perhaps not inferior to Molière, in his tragedies, not merely in the exhibition of the conflict of the mightiest human passions, but also in his representation of the workings of the most intricate and subtlest of human motives, he has no equal.

In the opinion of many critics the highest exhibition of poetic genius is to be found in the tragic drama, which naturally combines the fire and passion of lyric inspiration with that representation of outward circumstances, conduct, and events which belongs to epic poetry. It thus unites every advantage for the exhibition of human character. It not only shows us the external conduct, but in the various soliloquies and discourses of the *dramatis personæ* it reveals to us the hidden thoughts and passions of the soul. In this last respect it has a great superiority over epic poetry, in which, though the expression of feeling occasionally occurs, it is always made subordinate to the events of the story. See Theater.

Dram'men: seaport-town of Norway; in Aggershuus; on both sides of the river Drammen, near its entrance into the Christiania Fiord; about 24 miles S. W. of Christiania (see map of Norway and Sweden, ref. 10–C). It has a college, extensive sawmills, and manufactures of chicory, sailcloth, ropes, etc. Large quantities of timber are exported from this port. Pop. (1891) 20,684.

Draper, Andrew Sloan, LL. D.: lawyer and educator; b. at Westford, N. Y., June 21, 1848; educated in the public schools, Albany Academy, and the law department of Union University; practiced law in Albany 1871–84; mem-

ber of school board in Albany 1878–81; member New York Legislature 1881; one of the judges of the U. S. court of Alabama claims 1884–86; superintendent of public instruction, New York, 1886–92: LL. D., Colgate University, 1890; elected superintendent of schools in Cleveland 1892; president of the University of Illinois 1894; has published *What Ought the Common Schools to do? How Can it be Done?* (1886); *How to Improve the Country Schools* (1887); *The Powers and Obligations of Teachers* (1887); *School Administration in Large Cities* (1888); *The Indian Problem of the State of New York* (1888); *The Origin and Development of the New York Common School System* (1889); *A Teaching Profession* (1890); *The Authority of the State in the Education of her Children* (1890); *The Legal Status of the Public Schools* (1890); *The Normal and Training School System of New York* (1891); *The Responsibility and Authority of Trustees* (1891); *American Schools for American Citizenship* (1891); *Public School Pioneering in New York and Massachusetts* (1892). C. H. THURBER.

Draper, DANIEL, M. E., Ph. D.: meteorologist; b. in New York city, Apr. 2, 1841; son of Prof. John W. Draper, and brother of Dr. Henry Draper; educated in New York city, and obtained his doctorate from the New York University. From 1857 for several years he assisted his brother Henry in his observatory at Hastings on the Hudson. From 1860 he served an apprenticeship of five years at the Novelty Iron Works, passing through the foundry, mechanical shops, and drawing-room. In 1865–66 he was assistant port-engineer of the Star line of steamships to New Orleans. In 1867–68 he was amanuensis to his father in the preparation of the *Intellectual Development of Europe* and the *Civil War in America*. In 1869 he was appointed director of the New York Meteorological Observatory, in which position he has since remained and distinguished himself by the care with which he has conducted the work of the observatory, and by his success in the invention and construction of self-registering meteorological instruments. He has also issued annually an excellent report of the work of his institution, in which are given many discussions of meteorological topics. In particular his paper on the *Cause of Pneumonia* has attracted much attention, and been translated into several languages. M. W. H.

Draper, HENRY, M. D., LL. D.: scientist; b. in Prince Edward co., Va., Mar. 7, 1837; son of John William Draper; graduated at the medical department of the University of the City of New York in 1858; became Professor of Physiology there in 1860, and also Professor of Physiology and Analytical Chemistry in the scientific department. He published *On the Construction of a Silvered-glass Telescope* and *Text-book of Chemistry* (1864). He devoted much attention to photographic and spectroscopic examinations of the moon and other heavenly bodies. D. in New York city, Nov. 20, 1882.

Draper, JOHN CHRISTOPHER, M. D., LL. D.: physiologist and chemist; b. in Prince Edward co., Va., Mar. 31, 1835; a son of John William Draper; graduated in 1857 from the medical department of the University of the City of New York; Professor of Physiology there 1858–60; subsequently Professor of Chemistry in the Cooper Union, Professor of Chemistry in University Medical College, and of Physiology and Natural History in College of City of New York; published *On Respiration* and *Text-book on Anatomy, Physiology, and Hygiene* (New York, 1866). D. in New York city, Dec. 20, 1885.

Draper, JOHN WILLIAM, M. D., LL. D.: chemist and writer; b. near Liverpool, England, May 5, 1811; educated at the University of London, and emigrated to the U. S. in 1833. He graduated as M. D. in the University of Pennsylvania in 1836; was Professor of Chemistry and Physiology at Hampden-Sidney College 1836–39, and became Professor of Chemistry in the University of New York in 1839. In 1841 he was appointed Professor of Chemistry in the newly founded medical department of that university. In 1839 he took the first photographic portrait ever taken from the life. He discovered many of the fundamental facts of spectrum analysis, and published them 1841–50. He published *Human Physiology, Statistical and Dynamical, of the Conditions and Course of Life in Man* (1856); *History of the Intellectual Development of Europe* (1863); and *History of the American Civil War* (3 vols., 1867–68), and numerous monographs on mathematics, chemistry, and optics. D. at Hastings on the Hudson, N. Y., Jan. 4, 1882.

Draper, LYMAN COPELAND: antiquarian; b. near Buffalo, N. Y., Sept. 4, 1815; as secretary he edited the *Collections* of the Wisconsin Historical Society; State superintendent of public instruction, Wisconsin, 1858–59; largely instrumental in the collection of the State Historical Library at Madison of about 120,000 volumes. Author of *Madison, the Capital of Wisconsin* (1857); *King's Mountain, its Heroes* (1881); *Essay on the Autograph Collection of the Signers of the Declaration of Independence and of the Constitution* (1889). D. Aug. 26, 1891. C. H. T.

Draper, WILLIAM HENRY: Canadian jurist; b. near London, England, Mar. 11, 1801, and removed to Canada in 1820. He was admitted to the bar in 1828; became member of the Legislative Council in 1837; solicitor-general of Upper Canada in 1838, and afterward attorney-general. He was appointed puisne judge, court of queen's bench, in 1847; chief justice court of common pleas in 1856; chief justice of Upper Canada in 1863; and president court of errors and appeals in 1869. He was a brilliant and eloquent speaker. D. in Toronto, Nov. 3, 1877. NEIL MACDONALD.

Drapery [O. Fr. *draperie*, deriv. of *drap*, cloth: Ital. *drappo* < Lat. *drappus*, possibly of Germ. origin]: cloth or woolen stuffs, clothing, or apparel. The dealers in such commodities are called *drapers* in England. Drapery in painting and sculpture is the clothing applied to the human figure, the various costumes and modes of dress used by different nations and classes of people. The ancient Greeks, although they often executed nude statues of heroes and gods, surpassed all other artists in the representation of drapery and costume. The art of disposing the folds of drapery forms a considerable part of the painter's and sculptor's study, and requires good taste and judgment. See COSTUME.

Draught (of a chimney): See CHIMNEY.

Draughts: See CHECKERS.

Drave (anc. *Dravus*; in Germ. *Drau*; Slavonic *Drava*): a river of Europe; rises in the Tyrol, and flows nearly eastward, through Carinthia and Styria, to the western frontier of Hungary. It afterward runs southeastward, and forms the boundary between Hungary on the left and Croatia and Slavonia on the right, until it enters the Danube 14 miles E. of Essek. Its total length is nearly 400 miles. It is navigable for over 200 miles.

Dravid'ian Languages: a family of languages formerly called Tamulic, from Tamil, the chief member of the group. The objection to this name was that it was not sufficiently comprehensive. Dravidian is not altogether free from the same objection, for the name which the Aryans first gave to this family was "Andhra-Drivida-Basha," which means "The Telugu-Tamil Language." Nevertheless, Dravidian has become the generally accepted term for this group.

Scholars have been divided as to the relation which the Dravidians sustain to the Aryans. Carey, Colebrooke, Pope, and others have claimed that they were of Aryan origin, and that their language was an offshoot of Sanskrit. On the other hand, Rask, Norris, Max Müller, Caldwell, and others claim to have demonstrated that the Dravidian languages are independent of Sanskrit, except that they have borrowed largely from the Sanskrit vocabulary. What Trench says of the contribution of Anglo-Saxon and Latin to English may be said with equal truth respecting the relation and proportion which the Dravidian and Sanskrit elements bear to Tamil, Telugu, etc. "All its joints, its whole articulation, its sinews, and its ligaments, the great body of articles, pronouns, conjunctions, prepositions, numerals, auxiliary verbs, all smaller words which serve to knit together and bind the larger into sentences, these, not to speak of the grammatical structure," are exclusively Dravidian. The Sanskrit "has contributed its tale of bricks, yea its polished hewn stones, but the mortar, with all that holds and binds these together, and constitutes them into a house," is Dravidian.

A few of the distinctive characteristics of the Dravidian languages are as follows: The verb occupies the last place in the sentence. *He struck me* is rendered *he me struck*. Prepositions become postpositions. *To men* becomes *men to*. Nouns are inflected by means of postpositions. The first person plural has two pronouns, one of which includes and the other excludes the person addressed. Relative participles are used instead of relative pronouns. *The person who came* is rendered *the who came person*. There is no passive voice.

The territory covered by the Dravidian languages is, in general, the whole of the Indian peninsula, from the Vindhya Mountains, in the north, to Cape Comorin, in the south, and also the northern half of the island of Ceylon.

The number of Dravidian languages is twelve—Tamil, Telugu, Malayalam, Canarese, Tulu, Tuda, Kudagu, Kota, Gond, Khond, Oraon, and Rajmahal. Of these only the first four are cultivated languages, though Cust and others include also Tulu and Kudagu. As Tamil is undoubtedly the representative member of the Dravidian group, a fuller account of it may be desirable. Telugu, though second only to Tamil, need not be so fully discussed, and the remaining members need but the briefest mention.

Tamil.—Tamil was spoken in India before the Aryan invasions took place, or probably a thousand years before Christ. But when the Aryans entered India the Tamils were driven south, and now occupy the country lying between Cape Comorin, in the extreme south, and Lake Pulicat, about 25 miles N. of Madras, and inland from the Bay of Bengal about half-way across the peninsula, where it joins the Canarese country. It is also the language spoken in the northern half of the island of Ceylon. The number of people speaking Tamil is about 16,000,000.

There are two kinds of Tamil—the classical and the colloquial—and they are almost as different as Latin and Italian. It is the most copious as well as the most highly cultivated of the Dravidian languages. On this point Dr. Caldwell says: "The extraordinary copiousness of the Tamil vocabulary is shown by the fact that a school lexicon of the Tamil language, published by the American missionaries at Jafna, contains no less than 58,500 words; notwithstanding which it would be necessary to add several thousands of technical terms, besides provincialisms, and thousands upon thousands of authorized compounds, in order to render the list complete." It also has an enormous number of synonyms. There is reason to believe that ancient Tamil and Malayalam were identical; and there are the clearest evidences that the cultivation of the other Dravidian languages was long subsequent to Tamil. This is proved by the early Tamil inscriptions which exist. These are always in the Tamil character, and no Sanskrit inscriptions are to be met with in the Tamil country earlier than the fourteenth century. This is not the case with the inscriptions of the other Dravidian languages. Dr. Caldwell also finds numerous names of places which he says are petrified into Greek and Latin names. This shows both the antiquity of Tamil and the early date at which India began to be known to Europeans.

Telugu.—Telugu ranks at least second among the Dravidian languages. Tamil is probably older, as it certainly is more copious and more independent of foreign words. In euphony and melodious sweetness, however, Telugu deservedly holds the first place. From this latter quality it has been likened to Italian, and has, in fact, been called the "Italian of the East." As might be expected from the dominating influence of the Aryans, the Telugu, in common with the Tamil and other Dravidian languages, has incorporated a large number of Sanskrit terms. Of the higher or literary Telugu fully one-third of the vocabulary is Sanskrit. The proportion is less, however, in the language of the common people. It is chiefly because of this large Sanskrit element in the Dravidian languages that some have claimed for them an Aryan origin.

The Telugu country was originally divided into two kingdoms—the Andhras and the Kalingas. The former occupied the interior and northern portion of the country. The latter occupied the seaboard, and although less known to the Aryans, who gave the name Andhras to both nations, yet it is to the Kalingas that the name Telugu is to be traced. From Kalinga came Talinga and Tenugu—the name which is even now frequently applied to the language by some pundits. But the favorite derivation of Telugu pundits for Telugu is Trilinga, or country of the three lingas. These three celebrated lingas, or stone emblems of the divine creative power, are said to be at Kalahastry in the south, Sreesalem in the west, and Dracharamu in the north. A better known boundary is Pulicat in the south, Chicachole in the north, and Udgiri in the west. The country thus described contains about 73,728 sq. miles.

Canarese.—Canarese claims the third place among the Dravidian group. Its territory is W. of the Telugu country, S. of the Mahratta, and includes the Mysore plateau and portions of the Nizam's territory. The people speaking Canarese number about 10,000,000. In common with Tamil and Telugu, Canarese has a classical and colloquial dialect. The dialect of the Budagas, a numerous tribe inhabiting the Neilgherry hills, is a very ancient one. The Canarese character has a very close resemblance to the Telugu.

Malayalam.—Malayalam is spoken along the Malabar coast, and includes the native states of Travancore and Cochin. Caldwell places Malayalam second in the list of Dravidian languages, because of its close resemblance to Tamil. Cust, on the other hand, regards it as simply an offshoot of Tamil, though greatly altered, and for that very reason puts it fourth in the list. Malayalam is the language of the 300,000 Syrian Christians who dwell there. There is also a colony of white Jews who have lived there from a very early period. The population of the Malayalam country is about 4,000,000. Malayalam has a larger proportion of Sanskrit words than any other of the Dravidian languages.

Tulu.—Although Tulu has neither a character of its own, the Canarese character being used, nor a literature, yet Caldwell and others claim that it belongs to the cultivated languages. The number of people speaking Tulu is so small and they are so mixed with other tribes that the language will probably soon disappear.

Kudagu.—This also is regarded by Caldwell and Cust as being a cultivated language, but like the Tulu, it has neither character nor literature, and hence the claim is a doubtful one. The name Kudagu is seldom heard in India, Curg being the modern name of the country. Like the Tudas, the people practice polyandry and worship demons. The probabilities are that both people and language will soon be extinct.

Tuda.—Tuda or Toda is the language of a rude tribe who claim to be the original owners of the Neilgherry hills. Their claim, however, is denied, and the probability is that they were early emigrants to the hills from the Canarese country, and their language is probably a corruption of Canarese. They number only about 700; they practice polyandry, and are fast dying out.

Kota.—The Kotas are a small tribe of people of a very low type. They are, however, an industrious, peaceful people, dwelling among the Todas on the Neilgherries. They pay a small tribute to the Todas, who claim to be the lords of the hills. Like the Toda, the language is allied to the Canarese. It has no independent character of its own, nor any literature.

Gond.—The Gonds are a wild jungle people, numbering about 1,500,000, and occupy the hill country now included in the Central Provinces. They are divided into a number of tribes, four of which are called Koitors, and this is the name which the Gonds, as a whole, prefer to call themselves. To the missionaries who have settled among them we are indebted for nearly all that is known of the Gonds.

Khond.—The Khonds are a wild people inhabiting the hilly parts of Orissa. Up to a very recent date they practiced human sacrifices. The name Khond is traced by some to the Telugu word *konda*, meaning a hill. But the Telugus do not call the people Khonds, but Gonds, and as they call themselves Kus, the derivation from *konda* is at least doubtful. The number of Khonds is about 150,000.

Oraon.—The Oraons number about 275,000, and occupy the district of Chutia Nagpur in the province of Bengal. The language, though clearly Dravidian, is surrounded by the Aryan to such an extent that it has not only incorporated a large number of Aryan words, but even the pronunciation and orthography have been modified. Although it retains the chief characteristics of the Dravidian languages, yet, since it has neither a character of its own nor a literature, it will scarcely survive the struggle for life.

Rajmahal.—This is the name of a mountaineer tribe occupying the hills of the same name in the Province of Bengal. The language is Dravidian, though the Santals, who occupy portions of the same hills, are not Dravidians, but Kolarians. Another name for Rajmahal is Maler, but the common name is Rajmahal. Very little is known about the language. A few vocabularies have been compiled, but it is not at all likely that the language can survive.

The number of people speaking the Dravidian languages as above enumerated may be estimated as follows:

Tamil	16,000,000	Kota	1,112
Telugu	17,000,000	Gond	1,500,000
Canarese	10,000,000	Khond	150,000
Malayalam	4,000,000	Oraon	275,000
Tulu	300,000	Rajmahal	41,000
Kudagu	150,000		
Tuda	700	Total	49,417,812

According to this estimate the Dravidian races may be put down at not far from fifty millions.

Bibliography.—R. Caldwell, *The Comparative Grammar of the Dravidian Languages*; Dr. Bowen, *Tamil Language and Literature* (*Calcutta Review*, vol. xxv.–); Dr. Hunter's *Comparative Dictionary of the Non-Aryan Languages of India*; R. N. Cust, *The Modern Languages of the East Indies*; Introduction to Brown's *Telugu Dictionary*; Dr. Winslow's *Tamil Dictionary*. D. Downie.

Dravidian Literature: Tamil literature is of considerable extent. The more ancient portion of it was composed in verse. Works on grammar, medicine, theology, science, or art were, by the universal law of custom, written in verse. It is only of late years that Tamil prose has been cultivated to any considerable extent. Concerning the precise date of the rise of Tamil literature nothing is known with certainty. The ripest Tamil scholars can do no more than guess when any question of date comes up respecting the ancient works or their authors. One of the oldest, as well as one of the greatest, of Tamil poems is entitled the *Kural*. It was composed by Tiruvalluvar, a pariah, and probably was written before the tenth century A. D.

The following is one of the stanzas of the *Kural*:

> The flute is sweet; the lute is sweet say they
> Who have never heard the prattle of their own children.

Another celebrated poem is the *Ramâyana*, in Tamil. The version is by Kamban, one of the most fluent and ornate of the Tamil classical writers. The Tamil *Ramâyana* is not a slavish translation of Valmiki's Sanskrit epic, but it is rather an adaptation of it in Tamil. Two other famous Tamil poets of Kamban's time are Pugalendi and Ottakkuttan. Apparently there did not arise any great Tamil authors until two centuries after the death of Kamban, when there was a literary revival. A new poet, Athivîrarama Pândya, now flourished, and this elegant writer produced the *Neidadam*, the *Kâsikandam*, and *Vettri Verkei*—the latter a small poem which has attained enormous popularity. About this time, too, Villiputturâr translated the Sanskrit *Mahabhârata* into Tamil verse. At this period also was probably composed the most noteworthy of the Vedantic poems in Tamil, the *Gnâna Vâsishtham*. Not much later than this time were written those poems, full of similes and metaphors and pleasant moral aphorisms, which are taught in every Tamil vernacular school in the Madras presidency.

Since the beginning of the eighteenth century several writers of the highest eminence have flourished in the Tamil country. Among these Tayumânavar, of Trichinopoly, and Beschi, of Madura, have left an imprint of their genius on the literature of Tamil which will not be erased as long as that literature exists. *Tayumânavar* is perhaps the purest and most chaste of Tamil writers; his style is a model of elegant simplicity. His poems have a high philosophic and religious tone, and in some of them distinct traces of Christian ideas are to be met with. Beschi composed a large number of controversial treatises, as well as a Tamil satirical novelette, the first in the language. It is greatly owing to him that Tamil now possesses a prose literature. But it was especially as a poet that he left his mark upon Tamil. His great poem the *Tembavani* is recognized by the most learned Hindus as a Tamil classic of the highest merit. Brahman pundits named him Vira Mamuni, "the heroic devotee." Since Beschi's time the literature of Southern India has been enlarging itself at a prodigious rate, but, though a large number of works has been produced, their quality has sadly fallen off. The Tamil Bible, translated and published under the auspices of the Madras Bible Society, is acknowledged to be a work of rare scholarship and a most faithful rendering of the sacred Word. The Madras Religious Tract and Book Society has also published a large number of Tamil and Telugu works, prepared chiefly by missionaries and native Christian scholars, and a school lexicon in the Tamil language is published by the American missionaries at Jafna. Like Tamil, Telugu has a considerable literature, including all the great epic poems of the Hindus. In the library of Brown University, Providence, R. I., there is a copy of the Mahâbharata in eight volumes, written in Sanskrit in the Telugu character on palm leaf. William Carey, the Baptist missionary, was the first to translate the New Testament into Telugu. The missionaries of the London Missionary Society were the first to translate the whole Bible.

Canarese literature is not extensive, but it has a number of linguistic books, and the Bible has been translated into the language. There is a grammar of the Tulu language. Certain portions of the Bible have been translated into Ghond, and a brief grammar and vocabulary of that language has been published by Rev. J. Dawson, of Allahabad. A few Khond books have been written in the Uriya character, and a few vocabularies of the Rajmahal language have been compiled. D. Downie.

Drawback: in commerce, a paying back or remitting of money paid as duty, freight, or other charge. The term is especially applied (*a*) to the refunding or remitting by a common carrier of a part of the regular freight charges paid by the shipper, so that he really pays less for the services rendered than another person or persons is charged for similar services; (*b*) to an allowance made by the government to merchants on the re-exportation of certain imported goods liable to duties; also a repayment or remission of a duty laid on any article produced in a country and suitable for the foreign market, when such article is entered for exportation. In some cases this allowance or remission consists of the whole of the customs or excise duties; in others, of a part only. In the U. S. drawback has been regulated by various acts of Congress. Such duties are, of course, an enhancement of the natural price of the commodity on which they are imposed. The object of the allowance or remission is to establish or stimulate a trade with foreign countries in the commodity. Adam Smith, in his *Wealth of Nations*, thus speaks of the remission or repayment of the latter form of duty: "To allow," he says, "the merchant to draw back, upon exportation, either the whole or a part of whatever excise or inland duty is imposed upon domestic industry, can never occasion the exportation of a greater quantity of goods than what would have been exported had no duty been imposed. Such encouragements do not tend to turn toward any particular employment a greater share of the capital of the country than what would go to that employment of its own accord, but only to hinder the duty from driving away any part of that share to other employments. They tend not to overturn that balance which naturally establishes itself among all the various employments of the society, but to hinder it being overturned by the duty; they tend not to destroy, but to preserve what it is in most cases advantageous to preserve, the natural division and distribution of labor in the society." These remarks are subject to this qualification: provided the drawback is equally applicable to all domestic productions that are sought to be exported. It might, perhaps, be shown also, by experience, that the practice of giving drawbacks is liable to abuse: for, supposing a great fall in the value of some excisable article, it may be exported with a view, partly or entirely, to get the drawback. An important species of commerce would thus be fostered. Of course the government must guard against deceptions by exercising an oversight of the packing, weighing, tying and sealing of such goods, of their ownership, of the time when such goods were charged with the duties, and of the exportation; and in some particulars it requires a verification by oath.

Revised by T. D. Woolsey.

Drawbridge: a bridge which can be drawn back, lifted up, or swung around so as to prevent travel over it (as at

Tower bridge, London, England.

the portals of fortifications) or to allow vessels to pass. The swing or pivot drawbridges are in most common use, and these will be found described in the article Bridges. A rolling drawbridge is placed on friction rollers, and the

shore end is counterweighted so that it can easily be drawn back; these have been used but to a limited extent and only for very short spans. Lifting drawbridges consist of one or two leaves, or spans, which turn in a vertical plane; these have also been little used, but there are two which deserve notice.

The Tower bridge across the Thames in London has two movable leaves, each of which is 50 feet wide, 100 feet long, and 950 tons in weight. When closed these form a roadway 29 feet above the water and 200 feet in span. When they are opened to allow the passage of vessels, foot passengers can cross over by ascending in elevators, situated in the towers, to a permanent foot bridge placed 135 feet above the water. This structure has also two side spans of 270 feet each. Its total cost is stated at about $3,000,000.

A lifting railroad drawbridge was completed in 1892 at the crossing of the New York Central and Hudson River R. R. over the Harlem river at 134th Street, New York. It is a double-tracked structure 93 feet long. The tower which carries the lifting machinery is 120 feet high. The bridge has two counterbalance weights of 45 tons each, and it can be raised or lowered in twenty seconds. See BRIDGES.

MANSFIELD MERRIMAN.

Drawee' and **Draw'er**: See BILL OF EXCHANGE.

Drawing: originally delineation, or representation, description, etc., by means of lines. By extension, the representation of solid objects on a plane surface, by means of lines and tints, and by contrast and gradation of dark and light. In this sense drawing is the applying of lines and tints to a flat surface in such a way that a picture shall appear there. But the original sense is also in use, and the drawing of an engineering draughtsman does not produce a picture of a machine or a canal-lock, but a conventional diagram by means of which the machine, etc., may be correctly made or put together. In like manner architectural drawing, as of a plan or section, will not produce a picture of a house or of any part of one. These kinds of drawing, by means of straight ruled lines, curves drawn mechanically, etc., are generally spoken of as *mechanical drawing*. Perspective and isometrical perspective are varieties of mechanical drawing, because they are produced by rule and with the general use of instruments of accuracy, but their purpose is the representation of objects nearly as they look to the eye, so that these methods approach artistic or free-hand drawing in their results. This last is the kind of drawing usually meant when the word is used alone.

Such free-hand drawing may be done with the lead-pencil, with what are called *crayons* (see CRAYON), with powdered crayon or *sauce* and the stump or *estompe*, which spreads the black powder over the paper, and may produce very delicate gradations, with a hard point on tinted paper (see SILVER-POINT), with pen and ink, with the brush and india-ink or sepia, or bister or other one-colored material, and, finally, with precisely similar materials, but of several or many colors. There are also some curious and unusual methods of drawing, as with a hot metal point which burns and chars a smooth surface of wood. Moreover, it is really drawing that an etcher does on the surface of his varnish, or a dry-point engraver on the copper, though it may be doubtful whether the term should be employed for engraving with the burin. See ENGRAVING.

The concrete term *a drawing* is applied to any piece of the mechanical work of architectural, engineering, or machinist draughtsmen, also to the slightest scrawls or feeble attempts of children and savages, and in writing and talking about the fine arts, to all pictures on a flat surface, not incised nor in relief, except oil-paintings, frescoes, the larger and more elaborate paintings on walls of any kind, and the more elaborate tempera pictures of old times. Thus in the exhibitions and studios it is customary to use *picture* for an oil-painting and *drawing* for a water-color.

RUSSELL STURGIS.

Drayton, MICHAEL: poet; b. at Hartshill, Warwickshire, England, in 1563. His chief work is *Poly-Olbion* (1613), a poetical description of the mountains, rivers, valleys, and forests of Great Britain, with the traditions connected with them. He was appointed poet-laureate in 1626. Among his numerous works are *The Barons' Wars* (1596), an historical poem somewhat tedious in character but containing many fine passages; *Poems, Lyric and Heroic* (1606); *Nymphidia*, a fairy poem (1627); and *The Muses' Elysium* (1630). D. in 1631.

Drayton, WILLIAM HENRY: statesman: b. in South Carolina, Sept., 1742. He wrote political works, was chosen chief justice of South Carolina in 1776, and president of that State in 1777. In 1778 he became a member of the Continental Congress. D. in Philadelphia, Sept. 3, 1779, leaving in MS. a *History of the Revolution*, which was published by his son (2 vols., 1821).

Dream: a series of thoughts, feelings, and acts of the imagination occurring in sleep. In some cases the reasoning powers are abnormally active in dreams, but in general the mental action is incongruous. Dreams usually are evidence of imperfect sleep. They take their character from some preceding state of the mind, and are often modified by the conditions of the health. The Bible speaks of dreams as being sometimes prophetic or suggestive of future events. This belief has prevailed in all ages and countries, and there are numerous modern examples, apparently well authenticated, which would appear to favor this hypothesis. The interpretation of dreams was a part of the business of the soothsayers at the royal courts of Egypt, Babylon, and other ancient nations. See SLEEP.

Dredges and **Dredging**: the machines and operations employed in removing submerged obstructions by mechanical means rather than by utilizing the natural forces of currents and tides, as in scouring.

The material may be lifted entirely from its site by various classes of dredges known as the *bag and spoon*, *dipper*, *clam-shell*, *ladder*, *grapple*, and others, which hoist a definite quantity of rock or earth at each movement; or it may be raised by *vacuum*, *sand*, or *centrifugal* pumps, and be ejected into barges or directly upon the neighboring shores through conduits; or it may be merely dragged off the reefs or bars by *scrapers* or *scoops* into deeper water adjacent to the locality.

The earlier forms of these machines as used by the Italians and Dutch were crude, limited, and expensive. The *bag and spoon* dredge, the simplest and earliest form, was much used on the shallow canals and ditches of Holland. It consisted merely of a leather sack laced to an iron ring of about 2 feet in diameter, having a cutting edge. It was operated by a pole, which served as a guide, while a rope fastened to the ring served to drag it along the side of the scow, at the bow of which a winch was fastened. A similar device was used on the Fossdyke Canal in England for removing 135,000 tons of soft material. It is slow and very limited in application.

The scraper consists merely of a scoop of iron or steel attached to the lower end of a beam, which is pivoted at its upper end to a scow. It is operated by towing or dragging the scow over the bar, from which the material is scraped off mechanically. It is a very inefficient device in this form, and the results are not permanent where there is a current. The earlier form of scraper dredges consisted of two barges moored on opposite banks of the channel to be improved, and connected by ropes running over pulleys. A bucket was suspended by chains so as to traverse the interval between the boats, across the bottom of which it was drawn by a windlass and crab operated by six men for the full

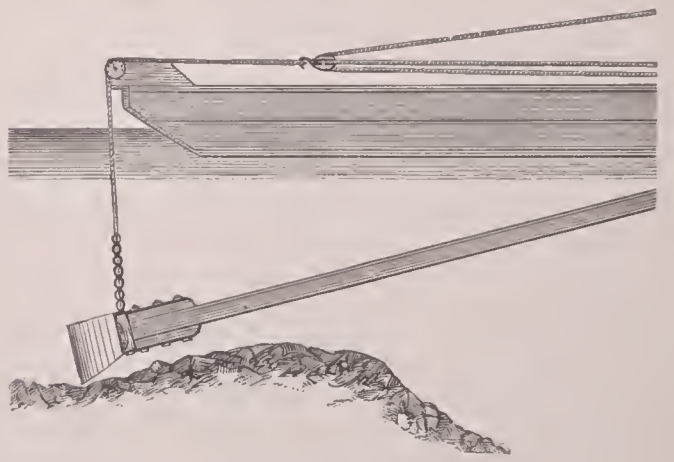


FIG. 1.

bucket and two for the empty. This process was in use on the river Tay in Scotland until 1833, but was primitive and prevented navigation during its operation.

The application of steam to dredging is said to have been first made on the Wear at Sunderland, England, in 1796, when a machine was made for Mr. Grimshaw by Boulton and Watt.

Ladder or *bucket dredges* consist of a series of scoops or

buckets attached to an endless belt or chain passing over the side of the vessel or through an opening amidships, and working over pulleys or wheels so arranged that the chain can be lowered or raised to suit various depths of water. The buckets descend empty, fill themselves at the bottom, and when they rise over the upper wheel discharge into troughs leading to scows alongside.

Fig. 2 shows a longitudinal section, and Fig. 2a an enlarged view of buckets and lower wheel, of a powerful steam-dredger used on the river Clyde, Scotland. The hull is of boiler plates and angle iron, being 161 feet long, 29 feet breadth of beam, and 10 feet greatest depth of hold. An endless band, carrying 40 dredge-buckets of nearly 14 cubic feet capacity each, works through a well amidships, passing over two wheels, one at either end of an iron bucket-girder 90 feet long, and weighing 125 tons when working, inclusive of the contents of the ascending buckets and hoisting chains. The axis of the upper wheel is stationary at the height of about 30 feet above the water, and the girder revolves about this axis sufficiently, by raising and lowering the submerged end, to allow the dredging to be carried on at any depth from 6 feet to 30 feet. One man, by means of a lever on deck, has complete control of raising and lowering the bucket-girder.

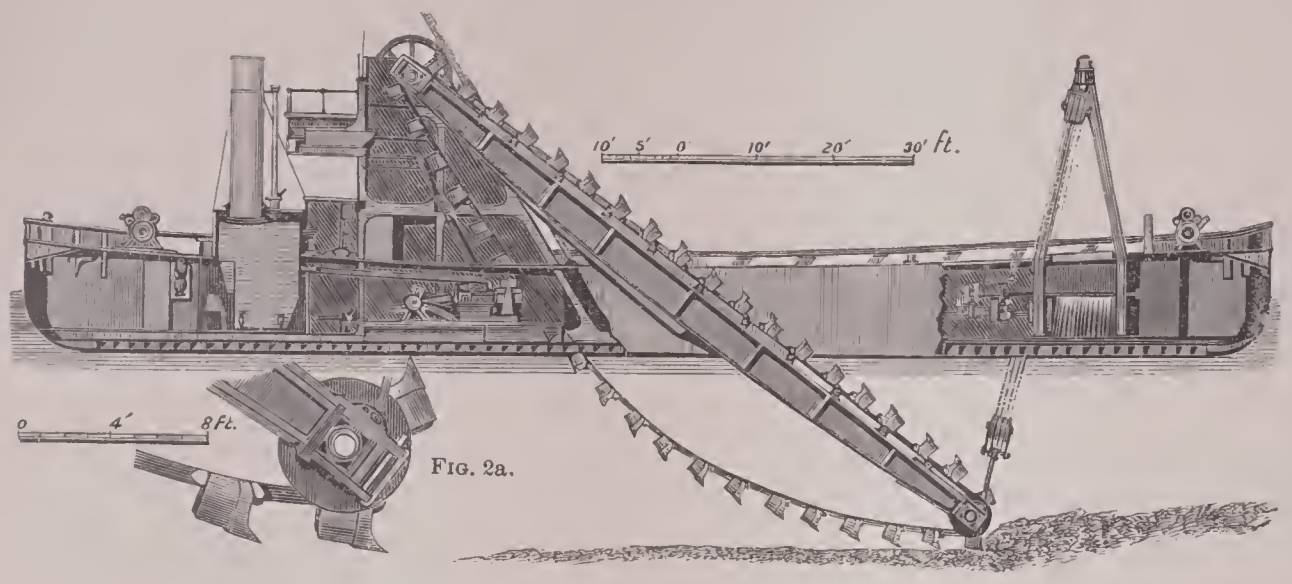


Fig. 2a.

Fig. 2.

By suitable appliances provision is made for moving the vessel ahead, astern, and athwartship. Surging heads are also fitted to crabs to haul the hopper barges alongside, also hand gear to work the surging heads independent of steam. Friction gearing is provided and adapted to work these moorings at three different speeds. The main gearing and girder hoisting gear are also fitted with adjustable friction-wheels, to prevent accidents in case of undue strain coming on the buckets or girder. This dredger, working at full speed in 10 or 15 feet of water, can raise about 500 tons, or 380 cubic yards, of ordinary soil per hour.

The European commission employed on the Sulina branch of the Danube the open-ended single-ladder machines with mud-pumps, such as were used also on the Amsterdam ship-canal as well as at St. Petersburg.* The material was conveyed through floating tubes over dikes 8 feet high. The dredges were 115 feet long, 25 beam, and 10¾ draught. Each machine was operated by a 40-horse-power engine, and had a capacity of only 1,300 cubic yards per day of twelve hours in favorable ground. The average cost of this dredging was 6·2 cents per cubic yard, and for towing 4,000 feet 2 cents, exclusive of depreciation and interest on plant. When the mud-pumps and distributing-pipes were used the cost was increased to 7·5 cents per yard. The season was but 200 days long, and coal was dear on the lower Danube. In the inner port at Boulogne, France, the plant consisted of two powerful bucket-ladder dredges, which discharged into hopper barges having a 2-mile haul. The contract price was 24½ cents per yard in the barge. The material was mud and sand mixed with stones; underlying this was a hard stratum of clay and schist, for which the price was 64¾ cents. The buckets were too light, and repairs were frequently necessary.

The first bucket-ladder dredge was driven by steam at Sunderland harbor, Oct., 1811, of which it was said: "A steam-engine of great power was erected upon a floating barge, which continually drove round a number of iron buckets fastened to a chain, which filled themselves with sand and gravel at the bottom of the harbor, and successively emptied themselves at the top of a shaft into a spout to receive them. The machine could lift 55 tons in thirty-five minutes." This type gives a very low efficiency, as most of the power is required to run the machinery.

On the Suez Canal the plant consisted of a ladder dredge with a shoot and supporting girder, about 73 feet in length, a portion of which is not shown in the illustration. Where the banks of the canal were too high to use the long-shoot dredger, an elevating apparatus was employed, consisting of a portable tramway supported by two parallel lattice girders, the lower end, about 10 feet above the water, resting upon a barge in the canal, and the shore end, 45 feet above the water, upon a truck running upon a railway laid along the bank of the canal. In operating this apparatus the dredgings are first delivered from the dredge into boxes arranged side by side upon a raft or float; the raft is then floated under the lower end of the tramway, and the boxes are hooked on, one after another, to the lower side of the tramway truck, and conveyed to the upper end of the tramway and tipped by steam-power. This arrangement is shown in Fig. 4, a portion of the shore end not being shown in the illustration. The tipping is effected by two wheels attached to the lower rear edge of the box which run up a steep incline at the upper end of the tramway.

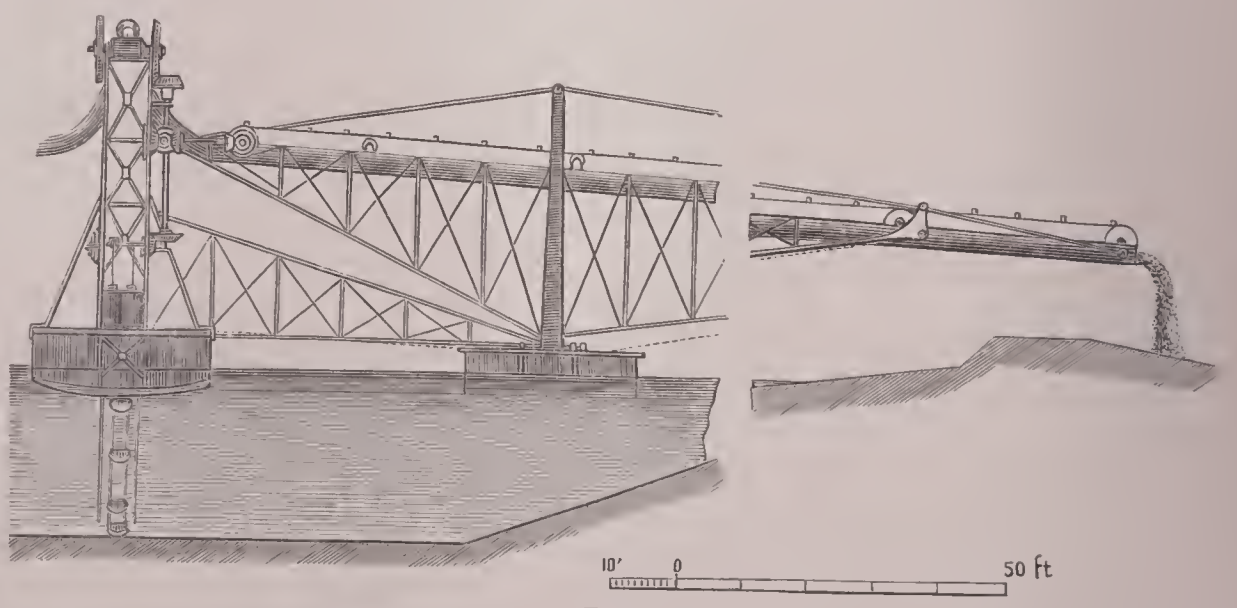


Fig. 3.

Wheel Dredgers.—Instead of an endless chain to carry the buckets, these are sometimes placed upon the perimeter of a wheel 25 to 30 feet in diameter, or larger according

* See *Engineering*, Nov. 8, 1872.

to the depth to be dredged. This wheel is set in a well in the boat, its axle or shaft working in boxes that can be lowered or raised by suitable machinery as the depth requires. As the wheel revolves the buckets scoop themselves full at the bottom, and in ascending lift in succession the upper end of a shoot adjusted against the perimeter of the wheel, which, falling back to its place, causes the bottom of the bucket to unlatch, and the contents to be discharged into the shoot, and thence into a scow alongside. The dredge-boat is drawn along by a cable leading to the engine at the precise rate which the progress of the excavation requires. Under favorable circumstances a 24-foot wheel carrying four buckets has been known to excavate 1,200 cubic yards in ten working hours. See Fig. 5.

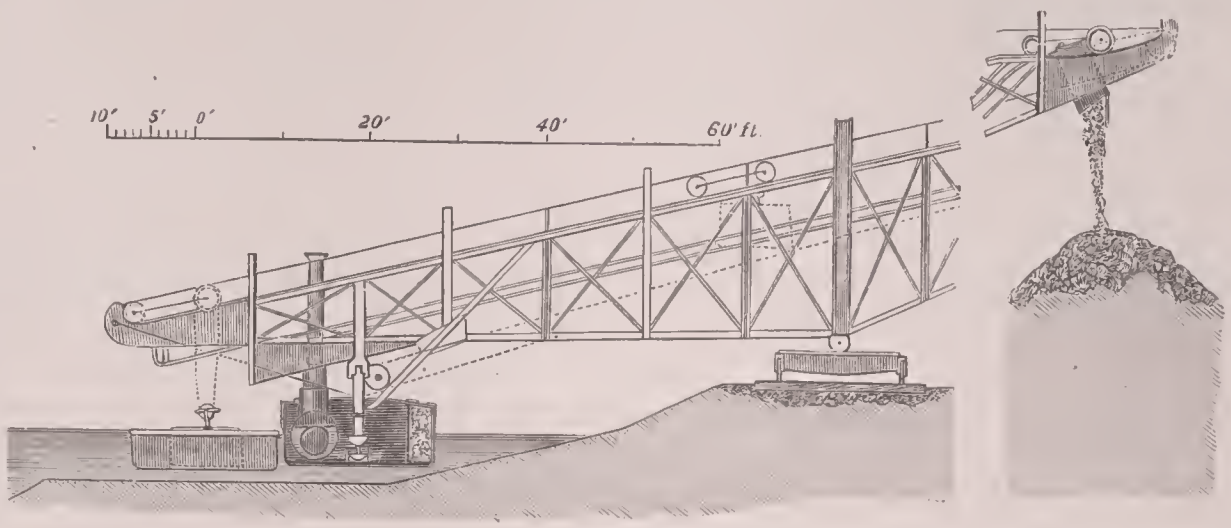


Fig. 4.

Clam-shell Dredgers.—Each dredge-boat operates but one bucket, which is in two parts hinged together horizontally, something like a clam-shell, with arrangements by which it is opened and closed by the same power which lowers and raises it through the water. The bucket, being open and suspended from the end of a crane-jib, descends vertically through the water until it rests on the bottom. It is then filled by closing together the two parts, when it takes the form of a short horizontal trough or hollow semi-cylinder closed at the ends. It is then raised out of the water, swung round over a scow, opened, and emptied.

When working in hard material like compact clay, hard sand, or gravel, the cutting edges of the bucket are provided with sharp teeth.

The bucket is guided in its descent by a pair of wooden poles attached to the guides of the crossbar, and working up and down through eyes near the end of the crane-jib. For raising stones, logs, fragments of wreck after blasting, etc., a strong grapple with steel-pointed prongs is used in place of the bucket.

A mammoth grapple-dredge was used in removing obstructions in the East river at New York. The barge was

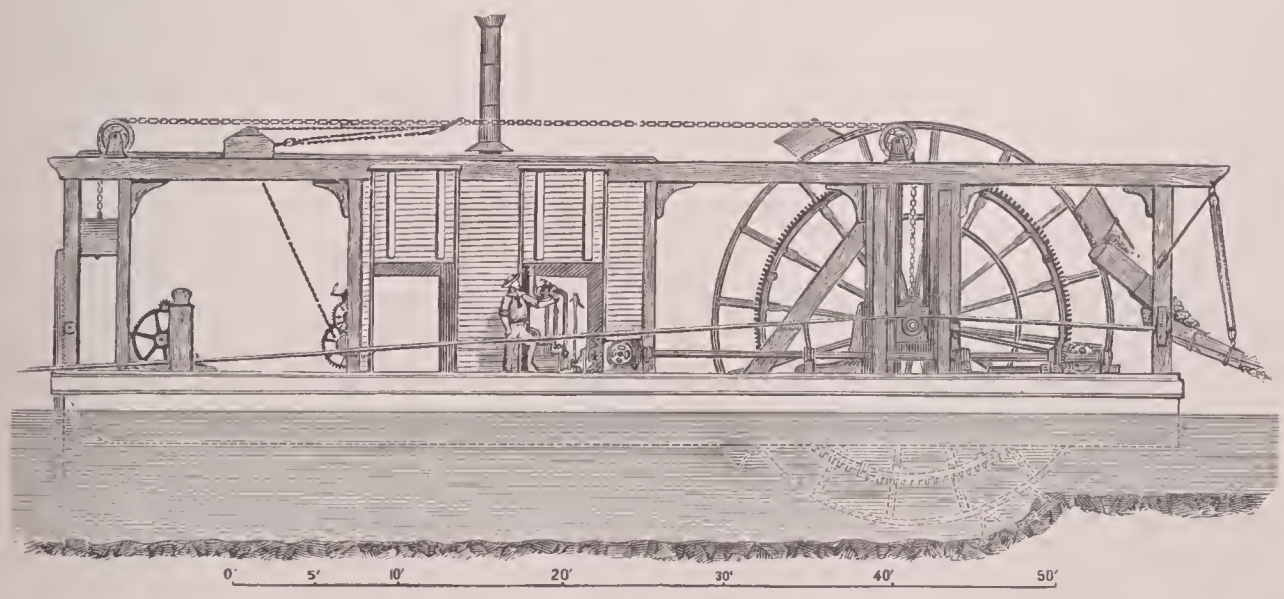


Fig. 5.

120 by 44 by 15 feet deep. The beam was 65 feet long, and sustained grapples having a clear opening of 15 feet and weighing 14 tons. The grapple was operated by 1¾-inch steel-wire ropes connected with a friction drum on the scow. This machine was designed to hoist boulders weighing 70 tons, the average load being 20 to 30. These machines were used on Hell Gate and Flood Rock reefs, in a strong tideway, and were built by the Atlantic Dredging Company.

Fig. 6 gives a view of the longitudinal section of a *clam-shell dredger* manufactured in New York (perhaps the best of the kind), and Figs. 6a and 6b the bucket and grapple of such a dredger. For these dredges two sizes of buckets are usually made: the smallest weighs 3,500 to 4,000 lb., with 1½ cubic yards actual capacity, or 2 yards when heaped up, and the largest weighs 6,500 or 7,000 lb., with 3 cubic yards actual capacity, or 4½ to 5 yards when heaped up. The teeth are made from 6 to 9 inches long. The grapples also are of various sizes, the largest being 5 feet along the hinge, and 8 feet wide between the points of the prongs when open. In 25 feet of water three lifts can be made in two minutes with the 3-yard bucket. The largest dredge-boats are 80 feet long and 30 feet wide, and the smallest 60 feet long and 25 to 30 feet wide. The power for the heavy grapple is supplied by two 20-inch cylinders with 20 inches stroke, 45 lb. steam-pressure, and making from 40 to 60 revolutions per minute; for the large buckets, two 12½-inch cylinders with 30 inches stroke, 75 lb. steam-pressure, and making from 60 to 70 revolutions per minute; and for the small buckets, two 10-inch cylinders with 24 inches stroke, 75 lb. steam-pressure, and making from 60 to 70 revolutions per minute.

In Baltimore harbor a machine with a 3-yard bucket, operating partly in soft mud and partly in oyster shells, in 26 working days, of which 7 were lost by breakages and bad weather, leaving only 19 days work of 10 hours each, raised 26,334 cubic yards, or a daily average of 1,386 cubic yards. The best day's work was 1,980 cubic yards. The average depth of water-way was 21 feet, with occasional lumps with 16 feet soundings. The depth to be attained was 24 feet. Another machine with bucket of the same size, in 26 days, of which two were lost, raised 48,000 cubic yards. In the same harbor, operating in soft mud in a 16-feet channel, to make it 24 feet deep, a machine with a 1½-yard bucket, working 26 days, of which 7½ were lost, raised 23,310 cubic yards. The best day's work of 10 hours was 1,665 cubic yards. Another machine of the same size, working 21 days, of which two were lost, raised 19,109 cubic yards. The aggregate quantity raised by the four dredgers during the respective periods above specified agreed to within about 150 cubic yards with the return made by the engineer inspector, upon which payment for the work was made. In Boston harbor a 3-yard bucket of the kind shown in Fig. 6a, working 26 days in stiff whitish-gray clay, raised only 3,335 cubic yards, or 128¼ yards per day of 10 hours. In this case the teeth did not penetrate more than 8 or 9 inches, tearing up the clay in large lumps, but not so as to fill the bucket.

In making shallow cuts much time is lost in moving the dredger forward.

Single-scoop or Dipper Dredgers (Fig. 7).—By these machines dredging is performed with a single bucket, shaped, as the name implies, like a scoop or dipper, having a swinging door closing with a catch at its back, by which it is emptied. This bucket is fixed to a beam or handle of a length suitable for any depth of water in which the dredger is intended to work. The bucket with its handle is worked from a crane, which has its post set on a movable platform placed in the center of the bow of the dredge-boat. The crane-post, jib, and stay are each built of two parallel timbers, secured to one another at the foot of the stay, neck of the post, and end of the jib. The bucket handle works in the space left between these parallel timbers. This beam or handle is slotted for the greater portion of its length, and on the back, on either side of the slot, has two racks working on pinions whose shaft is fixed upon the crane-jib about one-third its length from the post. These racks are kept in contact with their pinions by a friction-roller pressing on the front of the handle, and made fast by a link passing through the slot to the shaft of the pinions.

An improvement on the ordinary crane, which had a radius of about 19 feet, has been applied to the scoop used in the Osgood dredge, namely, an extension of the end of the crane-jib, by which a longer cut ahead can be made by the bucket and a greater width of bottom covered by the swing of the crane, thus saving time which would otherwise be lost in moving the machine. The extension of the jib is carried out nearly horizontally, the bucket being suspended as before described, with the exception that the outer shive at the end of the jib becomes a traveling one, with a tendency to keep a position directly over the bucket. In machines with the larger-sized buckets the cranes have a counterpoise attached. In very hard ground the bucket is taken off and a pick or plow attached, with which the ground is broken up, to be afterward picked up with the bucket.

These machines are made of various sizes, those most commonly built having buckets of 3, 1¾, and 1½ cubic yards capacity. The dimensions of boat for the larger machines are about 65 feet length, 26 feet beam, and 6½ feet depth of hold, and having a hoisting chain of 1¼ inches. Their power is derived from a pair of 15-inch cylinders with 12 inches stroke.

The larger machines of this pattern, with 3 yards capacity of bucket, when working in soft mud under the most favorable circumstances—that is to say, from a fixed position—will average in 20 feet of water about 2,000 cubic yards per day of 10 hours. Under ordinary circumstances it may be expected, in a series of working days of 10 hours each, to average about 1,300 cubic yards of soft mud or 800 cubic yards of gravel and sand.

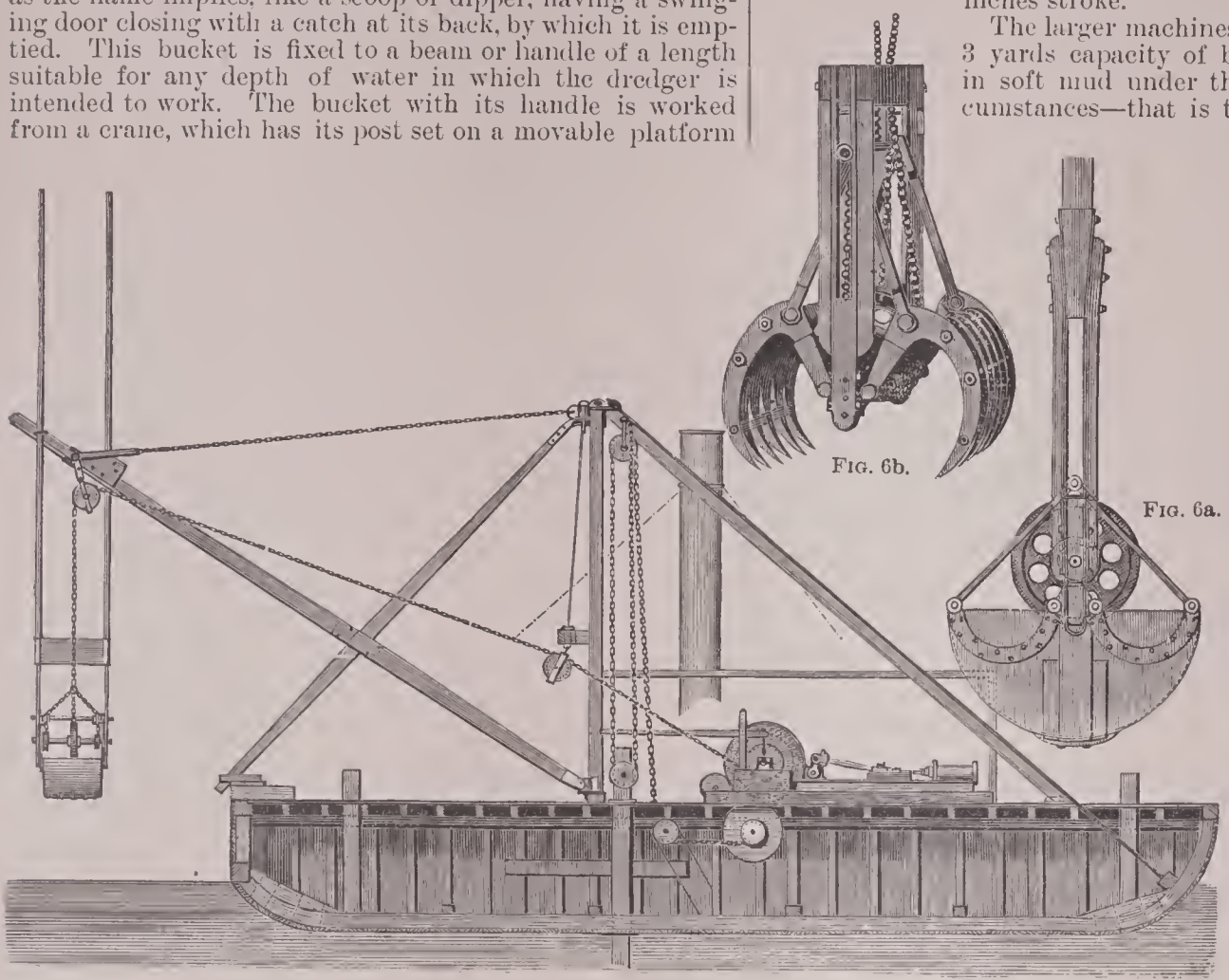


Fig. 6b.

Fig. 6a.

Fig. 6.

In the slips of New York a machine with a bucket of 1½ cubic yards capacity, 7-inch cylinders with 12 inches stroke, a steam-pressure of 60 lb., and with 200 revolutions, working in soft mud, in 12 days of 10 hours lifted 10,302 cubic yards, or 859 yards per day. The best day's work was 968 yards. The same machine working in soft mud at Wallabout, Brooklyn, with a cut of from 2 feet above to 10 feet below low water, in 131 working days of 10 hours lifted 72,621 cubic yards, or nearly 555 yards per day of 10 hours. At the same place the same machine, working in gravel and sand, with a cut of from 15 to 22 feet below low water, in 14 days lifted 5,591 cubic yards, or nearly 399 yards per day of 10 hours.

Another machine with a 1¾-yard bucket, and with cylinders of 10 inches diameter and 15 inches stroke, cutting to a depth of 10 feet through a meadow at the junction of the Delaware and Schuylkill rivers, the material seemingly consolidated mud, in 26 working days of 10 hours lifted 12,532 cubic yards, an average of 482 yards per day. The same machine, near Philadelphia, working from a fixed position, picking up soft mud which had been dumped under it from scows, and loading into cars, lifted 1,000 cubic yards in 10 hours; its average, however, was about 800 yards per day. These working days include the time lost in repairing chains and other slight damages incidental to the best running machines.

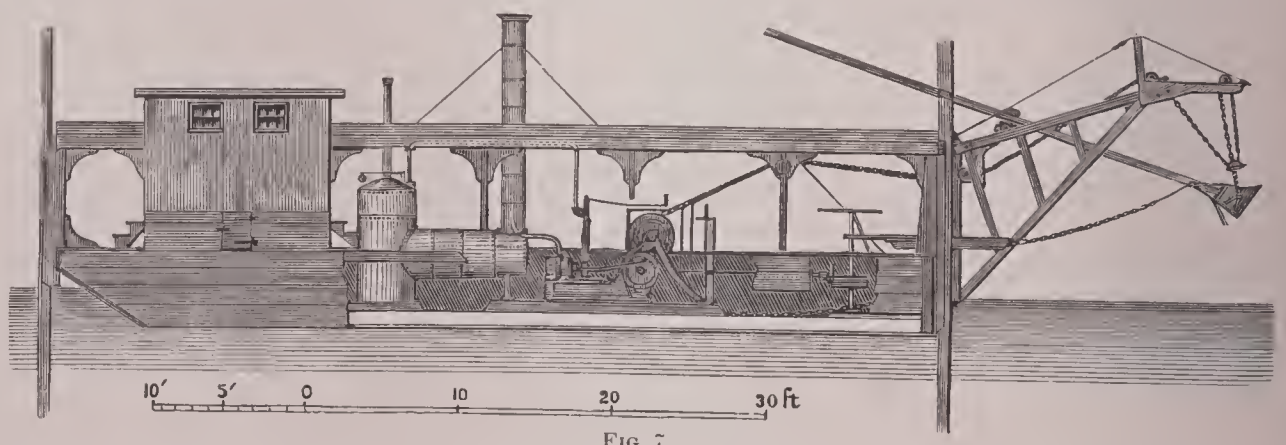


Fig. 7.

A tug of 100 horse-power can, with 4 scows of about 150 yards capacity each, keep one of the smaller machines busy when the tow does not exceed 3 miles. The smaller

dredger consumes about 1¼ tons, and the tug about 1½ tons, of coal per day.

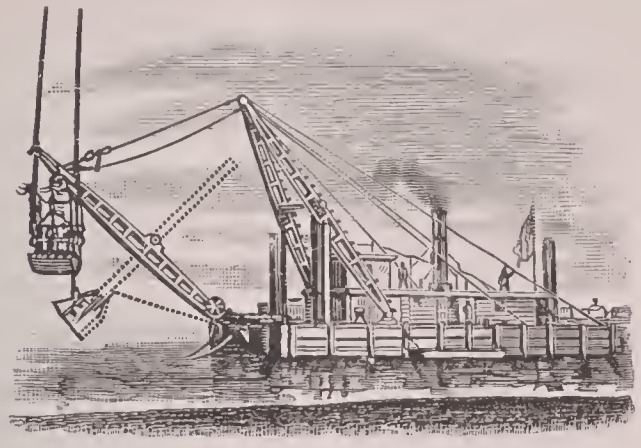


FIG. 8.—Osgood dredge.

CURRENT DREDGES constitute a class of machines which are cheap, simple, and effective. The principle embodied in them is that of a vertical deflection of the currents and a partial reduction in the area of the cross section, whereby the head as well as the velocity due to it are increased. Thus in the formula for the discharge of a stream, $Q = A\,V$, the velocity V varies directly as Q, the quantity, and inversely as A, the area of cross section. As the bottom velocities are very low, while those near the surface are high, to utilize these higher velocities for scour many simple devices have been tried.

Kingston dredger was one of the earlier forms. It was used on the river Stour, in England, and consisted of a boat with a broad rake fitted to the bow, and capable of adjustment to different depths. At the side of the boat were hinged two wings of the same depth. The rake being dropped

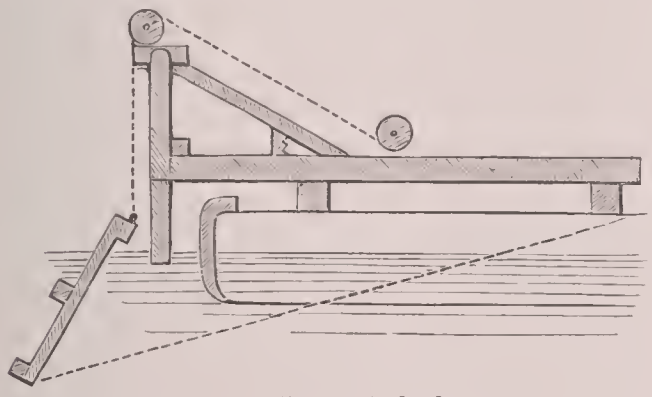


FIG. 9.—Kingston's dredge.

to the required depth and the wings extended, they formed a temporary dam, causing a "head," varying from 6 to 12 inches, which drove the boat forward and carried the mud with it. The rate of motion was 3 miles per hour, and the results were very satisfactory in cleansing the river.

For removing the silt from the tail bays of the Indian canals at Calcutta and on the Orissa coast, Mr. John Kingston proposed a simple wooden shield to be lowered over the down-stream end of the barge and hauled taut at an angle, so that its lower edge rested near the bottom, thus forcing the current under it and cutting away the bar. The barge was let down stream by hawsers or by a tug at a slower rate than the currents. See Fig. 9.

This idea has also been applied on the Garonne, in France, where a very similar device was employed for removing bars at the rate of about 60 yards of clay and sand per day, at an expense of 4½ cents per cubic yard. The boat was but a small affair.

Mr. J. Henry Apjohn has enlarged and improved upon Mr. Kingston's elementary device, until he has produced an iron caisson carrying a deflector operated by a walking-beam, whereby the bars are cut down at the rate of from 6 inches to 2 feet for a length of 300 feet in about two hours.

In 1885 the writer, believing himself to be a pioneer in the matter of utilizing surface currents for scour, patented the simple device shown in Fig. 10, and soon after tested its efficiency by erecting a temporary plant supported on piles driven into a bar on the Delaware. In two tides, or after about 22 hours, it had increased the depth from 9 to 18 feet, and for a distance up and down stream of about 300 feet, at the 9-foot curve, leaving no doubt as to its practicability where the material is not required to be taken out of the bed of the stream.

The general principle, however, had been anticipated in the device of Gen. P. G. T. Beauregard, of New Orleans, La., who, on Oct. 25, 1853, obtained a patent for a rectangular box open at both ends, but having an inclined diaphragm of timber placed inside, thus making the passage wedge-shaped. It was expected that the ebb tide passing through this contracted opening at the outer end would remove the sand of the bars from the mouth of the Mississippi. The apparatus was to be anchored with heavy stone. No means of locomotion were provided, and it was useless.

In 1876 Capt. J. Grant used a series of planks attached to vertical rods near the bottom, and so arranged as to be raised or lowered to fit the bed of the stream. They were held in place by a framework placed on a barge, which was held broadside to the current with which it drifted down, and by these means the bars on the lower Mississippi were shorn off

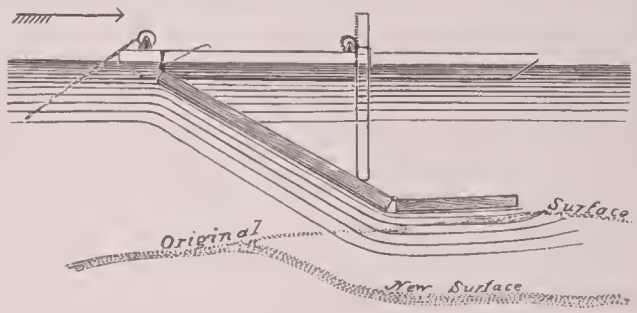


FIG. 10.

several feet, but as there were no permanent structures to change the regimen of the stream permanently, the bars soon formed again.

These are but a few of the many devices, some of which are quite complicated and local in their action, for removing bars by the application of surface currents. The same principle has long been in use in the *vannes* used in cleansing the *cunettes* of the Paris sewers.

Steam-pump and Hydraulic Dredgers.—At Boulogne the entrance to the port was for some years maintained by a steam hopper dredge with a sand pump, which ran to and fro across the bar when the swell did not exceed 3 feet for head waves and 1½ for cross waves. The haul to dump was 2 miles and the price 14½ cents per cubic yard, while the estimated cost of dredging by this plant was only the half of this sum. A similar plant was used by M. Plocq at Dunkirk in 1875, and was so successful that the French Government authorized its use at Calais also in 1881. During the year ending May 1, 1882, this dredge removed about 490,500 cubic yards from before the Dunkirk jetties, and obtained a least depth over the outer bar of 5¾ feet below zero.

On Oct. 19, 1870, a contract was entered into by the U. S. for enlarging the channel over the bar at St. Johns river entrance, Florida, by raking or otherwise, to a width of 80 and depth of 10 feet. The contractor never having secured more than 2 feet increased depth, his contract was annulled May 22, 1871, and Gen. Q. A. Gillmore assumed the work. He recommended a sand-pumping dredge, consisting of a 9-inch centrifugal drainage pump connected with two 6-inch suction-pipes with flexible hose—all mounted on a steam-barge 132 feet long, 24½-beam, drawing 5½ feet. The material was discharged in bins on deck through a 9-inch pipe, which was bifurcated into two 6-inch pipes. The engine was a low-pressure one of 120 horse power, containing two 10-inch cylinders of 10-inch stroke, running at 25 lb. pressure with a speed of 180 revolutions per minute. The pump was run by a belt at 315 revolutions.

The lower ends of the suction-pipes were loaded with an iron frame and drag, each weighing about 200 lb. To the under edge of this frame, below the mouth of the pipe, a number of teeth were attached to loosen the sand. Each pipe was supported by a chain reaching up to the deck of the steamer, and tackles were used for regulating the depths. The total cost for equipping this steamer was $6,300, while the rent of the boat was $2,500 per month. The total expense per month, including interest, was $3,000.

At high speed, from 50 to 55 per cent. of sand was pumped, but in consequence of the swell over the bar 45 per cent. was seldom reached, the average under favorable conditions being 35. The least cost during any one month was in May, 1872, when it was 26 cents per cubic yard. The greatest cost was in Dec., 1871, when it reached $1.22 per yard. The

best day's work was on May 14, 1872, when 770 yards were removed in $10\frac{1}{2}$ hours, at a cost of only 13 cents per yard. The average cost for the entire seven months was $52\frac{2}{3}$ cents. Much time was lost, due to low water and bad weather. The total quantity of sand removed during the fiscal year 1872 was 40,762 yards, giving a channel 150 feet wide at bottom, 9·7 feet deep, and 2,400 feet long at low water. The tide is 5·4 feet. The total expenditure during the year was $29,803.

This early and experimental dredge was improved upon from time to time until it has been developed into a machine capable of handling 3,000 yards per diem. The completion of the contract for dredging the main ship and Gedney's channels leading into New York harbor gives for the total cube of excavation under the several contracts 4,299,858 yards, costing $1,285,862.94, or $24\frac{48}{100}$ cents per yard, which, it is said, is only 23·37 per cent. of the original estimate. The dredges employed in this exposed locality were the Advance, with two 15-inch centrifugal pumps, and capable of carrying 500 yards; the Mt. Waldo, 275 yards capacity; and the Reliance, with two 18-inch centrifugals and a capacity of 650 yards. The material was raised from a depth of 24 to 35 feet under water to the bins on the dredges, a total height of from 36 to 46 feet. In addition to the three dredges there were provided four large scows of 500 yards each, four tugs, one steam supply-boat, one steam tender, docks, repair-shops, etc. The working capacity of the Mt. Waldo was eight scow-loads of 500 yards per diem.

The suction-pipes are 15 and 18 inches in diameter and about 60 feet long, terminating opposite the stern in suitable mouth-pieces, termed drags, to fit the bed of the channel and facilitate the ingress of material. The pipes contain a flexible rubber section to provide for rolling, and are suspended by chains, as in Gen. Gillmore's design. The Advance was sunk and destroyed by a collision during the work.

The following data are from the record of the Reliance: Average time pumping a load in Sept. and Oct., 1891, 48·6 minutes; cubic yards, 584·87; time per day in pumping, 4 hours 58·4 min.; time from bar to dump, 34 min.; dumping, $12\frac{1}{10}$ min.; back to bar, 25·7 min. Under steam per day, 16 hours 4·2 min. Number of loads per day, 6·73; cubic yards per day, 3,936·65; rate per minute, 12·03 yards. Time lost in repairs, 2 hours 24 min.; by bad weather, 32 hours 50 min. The total time lost out of $28\frac{1}{2}$ working days was 458 hours. Portions of the work were done at the rate of 946 cubic yards per hour. The round trip to the dump averaged 26 to 28 miles for part of the work, and from 12 to 14 miles for the balance. These pumps have raised up from the ocean bed bars of pig iron and cannon balls, passing them through the pumps to the hoppers 46 feet high. It is an efficient method of removing bars in a seaway, but there is in general no assurance of permanency in the results.

Another form of hydraulic dredge which has been brought to a high stage of perfection and remarkable efficiency is the machine patented by A. B. Bowers, of California. This consists substantially of a large barge carrying engines, boilers, pumps, cutters, and gearing, with a flexible distributing-pipe supported upon floats, whereby the spoil is conveyed ashore, and used for back filling and reclamation of low or marsh lands. The boat is so arranged as to cut a swath of about 130 feet in length, and to a depth of over 30 feet. The earth mixed with water is fed to a delivery-pipe extending to the cutter, and drawn into the delivery-pipe by a centrifugal pump. The invention dates back to 1868, when hydraulic dredges were very crude, but so rapidly has improvement been added to improvement that dredge No. 3, working at Tacoma on Puget Sound, put in place 165,000 cubic yards in July, 1891, and during the year, with a loss of three months, it handled 821,700 cubic yards.

The stimulus given by Mr. Bowers to this class of dredges has effected great economy in the removal of obstructions to navigation. In 1887 Sir John Coode described a small centrifugal dredge in use at the mouth of the Maas which lifted 400 tons of sand in 22 minutes. Had the hopper been large enough it could have pumped 1,000 tons in one hour. Ten or more smaller machines of this type had been working at that silt for seven or eight years, in an undulation of from 2 to 3 feet. The proportion of sand was about 20 per cent. The general principle of these machines, as covered by Mr. Bowers's patents, is a revolving cutter with interior delivery, connected with a non-rotating suction-pipe, whereby the spoil is removed from the cutter after suitable dilution with water, and pumped ashore or to hoppers or barges alongside. The proportion of earth to water removed by these dredges has reached over 70 per cent. Where the material must be removed from the stream they are the most efficient machines known.

Among the other devices belonging to this class of hydraulic machines may be mentioned the various pulsometers and the three-throw plunger pump patented by Mr. C. H. Booth and the sucker dredge of Mr. J. M. Robbins.

Dredging Operations.—Where the activity of the bar-building agencies is greater than the capacity of the dredging plant, successful competition is out of the question. Such instances are frequently found along the seaboard, where, between wave-action and littoral currents, the littoral drift is supplied faster than it can be removed. In rivers and embayed sounds or estuaries, the conditions are much more favorable. In Great Britain the best examples of successful works are to be found in the Clyde and Tyne. In the former the depth at Glasgow has been increased from 5 ft. 8 in. to 26 feet. Here the operations extend over 150 years, and although many millions of yards have been removed the improvement is not permanent, and a fleet of heavy dredgers is required to remove annually the million yards necessary to maintain the channel. The Tyne improvements date from 1861, and there is now a depth of 27 feet. The flood line has been lowered, and the scour greatly increased by the removal of the obstructing bars at the mouth of the river.

In the U. S. numerous attempts to dredge ocean bars or to cut through spits of sand have resulted in failure. It is only when such work is supplemented by permanent structures which modify the physical conditions that satisfactory results can be expected.

For more detailed and specific information, the reader is referred to *Minutes of Proceedings of the Institution of Civil Engineers*, especially vol. lxxxix.

Revised by Lewis M. Haupt.

Dred Scott Case: the case of Scott *vs.* Sandford in the Supreme Court of the U. S. in 1856, reported in 19 Howard R., 393. A slave named Dred Scott was carried by his master (Sandford) from Missouri into Illinois and Wisconsin, and thence back to Missouri. Scott was descended from Africans who were slaves. He brought an action in the circuit court of the U. S. to assert his title to freedom. The judgment of that tribunal was carried by writ of error to the Supreme Court. It was there decided by a majority of the court that if Scott were assumed to be free he was not a "citizen of a State," so as to bring the action; and further that he was still a slave. Accordingly, the case was dismissed for want of jurisdiction on the part of the circuit court. In reaching the conclusion that he was still a slave, the court held that the act of Congress which prohibited a citizen from holding slaves in the Territories of the U. S. N. of 36° 30′ N. lat. was unconstitutional and void. The action of the court has been severely criticised in respect to this last point, as being unwarranted after the decision was made that Scott, considered as a freeman, was not a citizen. It is maintained, on the other hand, that both questions under the pleadings were properly decided. Some information as to the circumstances under which the decision was rendered will be found in letters of Justices Campbell and Nelson in Tyler's *Life of Chief Justice Taney*, pp. 382–385. The chief justice, when delivering the opinion of the court, made an historical survey of the public opinion of the civilized world concerning the African race at the time of the formation of the American Constitution. Among other things he said: "They (the Africans) had for more than a century before been regarded as beings of an inferior order, and altogether unfit to associate with the white race, either in social or political relations, and so far inferior that they had no rights which the white man was bound to respect." Much injustice has been done him by an erroneous statement, still occasionally repeated, that the chief justice had himself affirmed that the Negro had "no rights which the white man was bound to respect." T. W. Dwight.

Dreibund: See Triple Alliance.

Dreisse'na [named in honor of Dr. Dreyssen, a Belgian naturalist]: the typical genus of the family *Dreissenidæ*, a group of fresh-water lamellibranchiate mollusks related to the mussels (*Mytilus*), differing, however, from the true mussel in having the mantle closed except at the branchial and anal slits. *Dreissena polymorpha*, a Russian species, in some manner introduced into English waters, has invaded even the water-pipes of London. Ten fossil species are found in Europe. Revised by F. A. Lucas.

Drelincourt, dre-lăn'koor', CHARLES: a French Protestant minister; b. at Sedan, July 10, 1595. He preached at Charenton, near Paris, from 1620 on, and gained great popularity. He was also distinguished as a writer of polemical theology. Among his very numerous works was *The Christian's Defense against the Fear of Death* (Charenton, 1651), which was translated into English and passed through many editions. Its sale in England has been accounted for by the fact that Defoe, in his famous story of *The Apparition of Mrs. Veal* (1706), makes that lady, "a maiden gentlewoman of about thirty years of age," assert on her return from the dead that Drelincourt, in his book on death, had presented "the clearest notions of death and of the future state of any who had handled that subject"; (Defoe's *Novels and Miscellaneous Works*, Tegg's ed., Oxford, 1840, vol. v., 344, 348). But the fact is that the book was very popular before the appearance of Defoe's pamphlet. D. in Paris, Nov. 3, 1669. —His son, CHARLES DRELINCOURT (1633–97), physician to William III. and Queen Mary, was the author of numerous medical works.

Drenthe, drān'te: a province of the Netherlands bordering on Prussia; area, 1,032 sq. miles. The surface is level and partly occupied by marshes. A large portion of the soil is poor. The rearing of cattle is the principal branch of industry. Capital, Assen. Pop. (1896) 143,028.

Drepa'nius, LATINUS PACATUS: a Gallic rhetorician; b. in Aquitania in the south of Gaul; classed among the Latin Panegyrists. He attained the rank of proconsul A. D. 390, and under this title was addressed by Ausonius in one of his poems, in which he pays a high tribute to the poetical abilities of Drepanius. Of his poetry nothing remains, but the panegyric which he delivered in the presence of the Emperor Theodosius in 389 A. D., when he was sent to congratulate the conqueror on the overthrow of Maximus, is extant, and is contained in the collection entitled *Panegyrici Veteres*, edited by Jaeger (Nuremberg, 2 vols. 8vo, 1799), and by Baehrens (Leipzig, 1874).

Dresden: capital of the kingdom of Saxony; called the "Florence of the Elbe"; situated in a beautiful valley on both sides of the river Elbe; 116 miles S. of Berlin, 72 miles S. E. of Leipzig; lat. 51° 3′ 16″ N., lon. 13° 44′ E. (see map of German Empire, ref. 5–G). On the left bank of the Elbe are the Altstadt, in which are most of the interesting buildings and collections, with three suburbs, and Friedrichstadt, separated from the Altstadt by the Weisseritz; on the right bank the Neustadt and the Antonstadt. The Elbe is crossed by three bridges, of which the oldest and most celebrated is the Augustus bridge. Dresden is the center of the Saxon railway system. Numerous steamers ply on the Elbe; the manufacturing interests are considerable; the chief exports to the U. S. are artificial flowers; the chief object of interest is the Zwinger, built in the Rococo style (1711–22) by Augustus the Strong, originally intended as the vestibule to an enormous palace, now containing the celebrated Royal Picture Gallery, a collection of engravings, zoölogical museum, mineralogical and geological museums and hall for mathematics and physics. The picture gallery is rivaled only by those of Florence and the Louvre. It contains over 2,500 pictures, being especially rich in specimens of the Italian, Dutch, and Flemish schools. Raphael's *Madonna de San Sisto*, the chief ornament of the collection, is exhibited in a separate room. The castle and residence of the King of Saxony contains the Green Vault, a remarkable collection of objects in gold, silver, amber, and ivory, precious stones, pearls, crown jewels, etc. The Museum Johanneum, on whose outer walls, facing the Auguststrasse, are the noted frescoes by Walther representing all the Saxon princes, contains an historical museum, a gallery of armory, and collection of porcelain. The Museum Albertinum contains plaster casts and a collection of casts of the works of the famous sculptor Rietschel. The Japanese palace in the Neustadt contains the Royal Public Library, numbering between 300,000 and 400,000 volumes, with 3,000 MSS. and 20,000 maps. The Brühl Terrace, rightly considered one of the greatest ornaments of Dresden, is a fine elevated promenade along the bank of the Elbe, running E. from the Augustus bridge and commanding a charming view of the Elbe and the surrounding country. The main park is the Grosser Garten, containing a palace built in 1660 and the zoölogical garden. The principal churches are the Frauenkirche, Sophienkirche, the Hofkirche, and the Kreuzkirche. The city contains an academy of arts, a technical school, four gymnasia, and numerous other institutions of learning, academies of science, etc. The principal street is Pragerstrasse in the Altstadt, a part of the continuous thoroughfare from the Elbe S. to the suburbs of the city, which bears successively the names Schloss-strasse, Seestrasse, Pragerstrasse, and Reichstrasse. The new König Johann Strasse, running E. from the Altmarkt, first opened in 1890, is a short but remarkably broad and handsome street, lined with fine shops. There are two theaters, the one in the Altstadt, a handsome building in the Renaissance style, erected (1871–78) on the site of the old opera-house which was destroyed in the revolution of 1849, devoted mainly to opera, with occasional representations of classic dramas; and one in the Neustadt, erected 1871–73, devoted to the production of comedies and light dramas. There are also one or two other theaters of less note. The two royal theaters are supported by the Government, and are no less remarkable for their admirable organization than for the celebrated actors and musicians permanently engaged. In the Altmarkt stands the monument of *Victory* by Henze. Other notable monuments of the city are the equestrian statue of King John, in the Theaterplatz, by Prof. Schilling, the statue of Weber by Rietschel, and that of Theodor Körner and the Rietschel monument on the Brühl Terrace by Schilling. Dresden has always been a favorite spot with tourists, and is especially attractive to English-speaking people living abroad. The picture gallery, the opera and theater, the educational opportunities, and the social attractions of the city unite to draw together a considerable colony of U. S. and British residents. A section of the Altstadt is known as the English quarter, and it is here that the English church is located. A part of the Neustadt S. of the railroad is known as the American quarter, and contains what is called the American church. A little beyond the church is the village of Raecknitz, where stands the monument to Moreau erected upon the spot where he fell in 1813. The surroundings of Dresden are extremely picturesque. The steamers on the Elbe offer enjoyable excursions, and an hour's ride by rail brings one to the famous region of the Saxon Switzerland. Dresden is of Slavonic origin, and was known as early as 1206, the present Neustadt having been first settled. In 1270 it became the capital of Henry the Illustrious, Margrave of Meissen. In 1485 it fell to the Albertine line, which has since held it. From 1405 to 1510 it suffered severely in the Seven Years' war; also in 1813, when it was the headquarters of Napoleon's army, and during the revolution of 1849; was occupied by the Prussians in 1866; since 1871 has been greatly improved and has increased rapidly in population. Pop. (1900) 395,349.

C. H. THURBER.

Dresden: town; Kent co., Ontario, Canada (for location, see map of Ontario, ref. 6–B); situated on railway and at the head of navigation on the Sydenham river. The town has a large trade in staves, timber, and lumber, and also has a ship-building industry and a large canning industry. Pop. (1881) 1,979; (1891) 2,058; (1893) estimated, 2,200.

EDITOR OF "TIMES."

Dresden, Battle of: a battle between the French and the allied armies of Russia, Austria, and Prussia, Aug. 27, 1813. Dresden was occupied by a French army of 30,000 men, when, on Aug. 23, 1813, the army of the allies appeared before it. Napoleon, with the main army, came to relieve it, and entered the city on the 26th of the same month. Schwarzenberg, the commander of the allied army, immediately assaulted and bombarded the city. Having been repulsed by a sally of the French guard on the 26th, he renewed the attack on the 27th, when a great pitched battle was fought, Napoleon gaining the victory. The French were forced to surrender the city on Nov. 11.

Dress [subst. of vb. *dress* < M. Eng. *dressen*, set right, make straight, clothe < O. Fr. *dresser*, arrange, dress: Span. *derezar*: Catal. *dressar*: Ital. *dirizzare* < Vulg. Lat. **directia're*, make straight, deriv. of *directus*, straight > Ital. *diretto*: Fr. *droit* > Span. *derecho*]: From the time of the first crude covering of the body with leaves, tradition and history furnish interesting accounts of the importance which savage and civilized people alike have attached to the clothing and ornamentation of their persons.

With all civilized or semi-civilized races some form of covering has been considered necessary to modesty and decency, but the ideas of what constitutes modesty have differed widely with different peoples and ages.

The history of dress is full of interesting inconsistencies and incongruities, and careful analysis of the successive forms of covering worn by successive races establishes the

fact that neither nature nor art has been recognized in any modern form of dress as fully as among the ancients.

The earliest Semitic races of which we have any authentic account—the Assyrians, Babylonians, Hebrews, Egyptians, Scythians—wore but few garments. The Old Testament often mentions raiment for the body, and the vestments of the early priesthood are enumerated in several important passages—Exod. xxviii. 42 (1491 B. C.): "And thou shalt make them linen breeches to cover their nakedness; from the loins even unto the thighs they shall reach." Other passages occur in Exodus, Leviticus, and Maccabees concerning sacerdotal vestments, and in other books of the Bible important mention is made of the raiment of needlework and jewels worn by kings and the daughters of kings (Gen. xxiv. 53; Ezek. xvi. 10–13, etc.). There is frequent mention also of purple and fine linen, and the sackcloth of sorrow and repentance.

Among the Hebrews mantles were made four-cornered and were, according to the law of Moses, bordered with fringes and ribbons of blue. Herodotus refers to Egyptian dresses of fine linen having a bordering of fringe about the legs. With the Israelites fringes and fine needlework seem to have been in universal use. Their garments were few in number. The sadin was worn next the skin, and the outer tunics were known as coats. Gold and silver were undoubtedly regarded as important adjuncts to the costumes of the Israelites, and there was a wide distinction in the richness of the garments and ornaments worn by people of different degrees of rank.

The monuments of the early Theban dynasties show little difference between the garments worn by men and those worn by women, the long flowing robe and girdle being common to both. Slaves and others who were obliged to labor were girt about the loins with a single garment. The early Egyptian dress was very simple, but after the new empire (1600 B. C.) it became exceedingly elaborate in ornamentation among the higher classes, and gold and precious stones were used for every form of personal adornment.

The Assyrians, who were advanced in the arts of dyeing, weaving, and embroidery, were celebrated for the beauty and richness of their attire. The invention of the Assyrian dress of rank has been attributed to Semiramis. This dress is said to have consisted of an undergarment embroidered and fringed, and confined with a girdle having cords and tassels. Over this a second garment, also richly embroidered, was worn nearly the length of the first. Sandals were worn by both the Assyrians and Egyptians. The fabrics employed for dress were very largely made from cotton and flax. Among the Egyptians woolens were forbidden to be worn next the skin, and priests were not allowed to enter the temples when this material formed any part of their attire; such parts were laid aside for the time.

The Greeks accepted and retained a fashion of clothing which gave the figure perfect freedom, serving at the same time as a graceful and attractive covering. There can be no doubt but that a kind of noble simplicity marked this period in dress. The *chiton* was the chief garment worn by women. This was a single piece of material sewed together and worn in the form of a long garment which was confined under the bust by a zoster or girdle. See COSTUME.

The Ionians wore a long linen *chiton* with sleeves, and the outside garment, known as *himation*, was of wool. The sleeves of the *chiton* were formed by drawing the folds of the garment down from the shoulders, and fastening them around the arm with buttons and loops.

Some modern writers have contended in support of the corset of the present day that the women of Greece and Rome wore a garment which served the same purpose, but there is nowhere any account of a similar garment. Both Greek and Roman women seem to have worn a kind of breast support, but it was a single band of cloth which served its purpose without having the objectionable tendency to compression and deformity which distinguishes the stays of latter centuries. For extra warmth a half-length garment, known as the *diploidion*, was worn outside the *chiton*.

Much attention was undoubtedly given to embroidery and dignified ornamentation by both the Greeks and Romans. While the character of their dress was simple, its perfect adaptation to the needs of their lives, to climate, and other conditions is not to be questioned. Among men there was a distinction in the garments worn. Workmen wore a garment which left the arms and legs free, while officials, priests, and those of rank wrapped themselves in the ample classic folds of the *himation*. Among the early Romans the loose and flowing tunica and toga found favor, and much attention was given to covering for the feet. The artistic value of dress during this period of the world's history, especially in the dignity of its flowing lines, has been established beyond a peradventure of doubt.

With the decadence of Rome's civil power, changes occurred which afforded practical advantages for war and work, and the trousers or *bracae* of the more active barbarian races came into use. There is no doubt that trousers originated in the highlands of Central Asia, which is now recognized as the birthplace of the Aryan race. The first trousers were worn by the Aryan people, who, under Cyrus, descended from their mountains into the fertile plains of Mesopotamia and overthrew the Semitic empires, which had ruled the Euphrates from the beginning of history. From this time the history of dress in Europe is changeable and nondescript, but the tendency for many centuries has been toward the degradation of the human form, and away from the recognition of that symmetry and simplicity which was the result of the idealization of bodily proportion as immortalized by the sculpture of the Greeks.

Through the centuries of the Christian era there have been certain arbitrary distinctions in dress, like the ecclesiastical, monastic, judicial, etc., which have been comparatively permanent, but the dress of the masses has been subject to frequent change, without reason, for a long period.

Among Eastern and Oriental nations generally no such changes have taken place, and very nearly the same simplicity of general design prevails century after century, all changes in dress being ornamental in character. The Orientals delight in flowing robes, gorgeous coloring, and rich ornamentation, but not in change of form. Western nations, on the contrary, revel in the most extreme and novel changes in the shape and cut of their garments, and pay comparatively little attention to true art in decoration.

This love of change in the form of dress has necessarily led to some most extravagant departures from symmetry and proportion in effects, and consequently to deteriorated physical conditions, since the internal organization has been compelled to conform to outward changes which were in direct violation of physiological law.

During the early centuries of the Christian era the robe of the primitive Christian minister was simple, loose, and dignified, and the magnificence of ecclesiastical costume obtained between the tenth and twelfth centuries, when the plain white of the early priestly robes gave place to materials of different colors, rich with various decorations of gold and silver work and gems, and wrought with elaborate embroideries. The principal vestments of the Christian ministry since the seventh century have been the alb, stole, dalmatic, chasuble, amice, tunic, cope, pall, surplice, and miter. The hood or cowl, gown or cassock, and cloak form the principal garments of the monastic order.

All nations have paid more or less attention to military dress, even savages having an instinctive appreciation of the effect produced upon their enemies by a brilliant display of paint and feathers; while more civilized nations have replaced the feathers with bullion and gold lace and other equally gorgeous paraphernalia for making their officers of rank impressive.

For many centuries a kind of dignity attached to men of profound learning, to judges, and other officers of state, which found expression in ceremonial dress of ample dimensions; but the age of reverence for everything human having passed, the leveling tendency of modern life has been toward doing away with all costume and insignia of learning and office, and what still obtains among the royalty and nobility of older countries is tolerated as an attractive spectacle where it was formerly regarded with respectful awe as the essential expression of superiority.

Planché writes of dress during the first centuries of the Christian era: "We must resort to those mosaics of Italy which have been preserved for us for a view of those dresses and ornaments which, worn at the court of Constantinople, became the fashion among the various races that had overrun the west of Europe during the first five centuries of the Christian era—the Greeks, the Goths, the Franks, and Lombards. In the *Revue Archéologique*, 1830, are copied mosaics from the originals of St. Vitale, Ravenna, one representing the Emperor Justinian, his court, and the clergy of Ravenna; and the other his wife, the Empress Theodora, and her attendants, said to have been the work of artists about the year 540. A singular mixture of Greek, Roman,

and Asiatic decoration gives a peculiar character to the costume of all classes at this period, and it will be remarked that while an Oriental taste was gradually increasing, to the obliteration of all features of ancient Roman classical dress among the people in and adjacent to Constantinople, the Franks and other Scythic or Teutonic nations occupying the old provinces of Rome were assuming more and more the dress and habits of the former empire of the West."

Mediæval dress is interesting as far as any historical facts are ascertainable. Men of the higher classes, nobles and knights, were so constantly in an attitude of aggression or defense that the principal feature of their attire was necessarily the protecting armor and garments to be worn under or over it, conforming to requirement. The three centuries following the settlement of the Franks in Gaul and the Saxons in England were marked by simplicity of attire and little variation. With the Norman conquest, however, many absurdities were introduced into dress. During the twelfth century sleeves became utterly preposterous in size and style, reaching nearly or quite to the feet of the wearer, while all manner of excess and luxury in personal adornment was indulged in. See COSTUME.

It would be impossible, in a limited article, to do justice to any of the important features of dress since the twelfth century, but a few of the more extravagant and eccentric fancies that have appeared in the clothing of men and women will serve to illustrate the utter degeneracy of dress at intervals during several centuries of our advancing civilization.

From the thirteenth century to the sixteenth head-gear was eccentric and exaggerated to such a degree as to defy accurate description. Addison, in the *Spectator*, chronicled the success of the monk Thomas Connecte, who traveled from town to town preaching down that wonderful head-covering known in his day as a *hennin*, with such vigor that women threw them aside in the middle of his sermon and made a bonfire of them in sight of the pulpit. Among the most celebrated of these monstrous head-dresses were the horned head-dress, the miter, and the butterfly. These strange devices were built to such height as to render passing through an ordinary doorway without stooping an impossibility, and the drapery depended from them sometimes reached to the floor. Anything more utterly at variance with all laws of beauty and art as a head-covering the human mind can not conceive, while ingenuity must have been exhausted in their construction. But head-dresses came in for part only of the exaggerated display of this period. From the time of Rufus to that of Henry VII. shoes were so grotesque in shape as to excite ridicule from poets and historians, as well as censure from the clergy. At one time shoes were worn so long and pointed that their wearers were compelled to fasten the toes to the knees by small chains. Waists were contracted to wasp-like dimensions with both men and women. In the time of George III. tailors advertised "Codrington corsets and Petersham stiffness for the benefit of gentlemen of fashion"; fifteenth-century gallants deserve sympathy in retrospect for the misery they must have endured in their clothing. The tunic was worn close and short, and their hose so tight that they were compelled to have assistance in dressing and undressing; their waists were laced, and their shoes so pointed and long as to embarrass movements.

Catherine de Medici is said to have invented a corset which was opened longitudinally by hinges secured by a hasp and pin like an ordinary box fastening. Among other absurdities in dress the enormous ruffs of Queen Elizabeth's time must be mentioned. Concerning these Stubbs wrote in 1583 as follows: "There is a certain liquid matter which they call starch wherein the devil hath learned them to wash and dye their ruffs, which being dry will then stand stiff and inflexible about their necks." The farthingale for women, a wheel-like contrivance which carried the skirts out from the hips, and the trunk-hose for men came into use at about the same time. Of the farthingale Sir Roger de Coverley said that it made his great-great-grandmother look as if she were standing in a drum. The portrait of Queen Elizabeth was painted in this unsightly garb, which continued in favor during the entire reign of James I. Early in the eighteenth century the dress of women was so fantastic that the *Spectator* declared the wife of a dignitary of state to be looped, ribboned and wrinkled and furbelowed until she resembled a Friesland hen. It is worth noting that during all of these successive centuries of exaggerations in the shape of dress, extravagance and splendor of fabric and ornamentation kept pace with the general spirit of excess. The sleeves to the *hauppeland* of Charles, Duke of Orleans, had embroidered upon them the words and music of a song. The lines of the music were worked in gold thread, and each note was finished with four pearls.

The nineteenth century has witnessed some remarkable changes in the shape and style of the garments worn by women, such contradictions indeed of the human form in its purity that it is difficult to believe that modern women could be found to disfigure themselves so. The enormous hoops worn in the sixties, in which women looked like animated pyramids, were no less artistic, and certainly not so vulgar as the bustle which after some years succeeded them.

In the early efforts of the few at "dress reform" there was no concerted movement in favor of all-round improvement, and there was a very widespread belief that freedom of body and artistic grace were incompatible, a theory which gained force with the masses by the example of the early dress-reformers, who offended good taste and æsthetic sensibility with their utterly graceless habiliments. The work of modern dress improvement is found to rest upon the sound principles of æsthetic grace no less than upon anatomical and physiological laws. The failure of early "dress reform" was due to the failure on the part of its advocates to recognize all of the principles involved in any general change not authorized by that arbitrary and inexplicable force known as fashion. The dress-reformers said, "The dress worn by women is wrong," but they did not demonstrate how to make it right upon any basis that appealed to critical judgment as embodying all that was needed in a change from existing forms and fashions. Dress reform, however well meant, did not rest upon the essential basis of symmetrical bodily development as a first principle, and the graceful and artistic clothing of the perfected structure in accordance with the laws of proportion, utility, and harmony. Without recognition of the philosophy underlying bodily expression, improved dress is impossible. Fashion does not recognize the body; it subjugates it, and becomes itself the central and arbitrary point of attraction. Fashion does not demand the co-operation of the body in expression, but rather seeks in every possible manner to deprive the body of independent expression in order that it may serve as an inconsequential model for the external decoration. Fashion does not seek to ornament the woman, but rather to use the woman as a lay figure for the display of its own novel features of attractiveness.

When, however, integrity of bodily function is the end sought, all of the conditions are reversed and the woman becomes a medium for giving expression to clothing. Decoration is then studied with the object of bringing out her best, drapery is designed to meet her requirements for utility and poetry of motion, and suggested instead of revealed form becomes the supreme ideal. Between these two extremes the work of early dress-reformers came in as a nondescript movement, conforming to neither the laws of fashion nor the laws of expression. Dress reform demanded of bodies that had been cramped into stays to the point of actual deformity, of sunken chests, rounded shoulders, curved spines, and protruding abdomens, that they should not only get along without the artificial supports to which they were accustomed, but that they should in such a state of physical degeneracy prove attractive points of display for clothing, which was in its main features devoid of all artistic consideration, being loose and comfortable only. Such a proposition, when arrayed against popular prejudice, was necessarily doomed to failure. But much good has come from the discussion that followed the aggressive earnestness of the dress-reformers; the dress-reformers made the dress-improvers possible because they awakened thought, and thought has led to study of the actual principles involved in a system of healthful and at the same time attractive dress.

Correct dress should not violate either health or the plastic beauty of the figure by cramping any part. The natural points of support, like the shoulders and hips, should be recognized as those from which all drapery should radiate in fine flowing lines free to follow and accentuate the movements of the body until the outward covering expresses the wearer's personality and suggests something special to each individual. The highest type of dress must recognize not only freedom, expression, radiation, and color, but such subdivisions as utility in freedom, grace in expression, harmony in radiation, and subtlety in color, qualities that should remain supreme through all the variations affecting the minor changes of dress. See COSTUME.

Bibliography.—Of the few books which give a critical account of dress there may be named: Planché's *Cyclopædia of Costumes or Dictionary of Dress*; Viollet-le-Duc's *Dictionnaire Raisonné du Mobilier Français* (vols. iii. and iv.); Paul Lacroix, *Mœurs, Usages, et Costumes au Moyen Âge et à l'époque de la Renaissance; XVII^me Siècle: les Institutions, Usages, et Costumes de la France 1590–1700*; and *XVIII^me Siècle: Institutions, Usages, et Costumes de la France 1700–1789*; Hefner-Alteneck, *Trachten des Christlichen Mittelalters*; also a later and larger work; Lane's *Manners and Customs of the Modern Egyptians*; Smith's *Dictionary of Greek and Roman Antiquities* (new ed. 2 vols., 1892); Ary Renan, *Le Costume en France*; Fairholt's *Costume in England, a History of Dress to the End of the Eighteenth Century*; Hughes's *Dictionary of Islam*; M. A. Racinet, *Le Costume Historique*; Quicherat's *Histoire du Costume en France*; Bouring's *Chinese Costumes*; Luard's *History of the Dress of the British Soldier from the Earliest Period*; Strutt's *Dresses and Habits of the English*; McIan and Logan, *Clans of the Scottish Highlands*; Wilkinson's *Manners and Customs of the Ancient Egyptians.*

There exist also many elaborate books of plates more or less accurately representing ancient costumes, but without any examination into their significance. Such are: Bonnard and Mercuri, *Costumes Historiques des XII^me, XIII^me, XIV^me, et XV^me Siècles*; Bruce's *Bayeux Tapestry*; *Hogarth's Works* engraved by himself, with descriptions by J. Nichols; Holbein's *Portraits of the Court of Henry VIII.*; Lodge's *Portraits and Memoirs of Illustrious Personages of Great Britain*; Du Sommerard, *Les Arts au Moyen Âge*; Jaquemin's *Iconographie méthodique du Costume du V^me au XIX^me Siècle.*

Many books exist devoted to ecclesiastical vestments and costumes, for which see the article Vestments, Ecclesiastical. Also for modern military costumes, see Thoumas, *Les Anciennes Armées Françaises* (very full, for the eighteenth and early nineteenth centuries); Scott, *The British Army*; and a number of books similarly devoted to different national armies. Annie Jenness Miller.

Dresser, Henry Erles, F. Z. S., F. L. S.: ornithologist; b. at Thirsk, Yorkshire, England, May 9, 1838; educated in England, Germany, and at Upsala, Sweden; a business man who has devoted his leisure time to ornithology, especially to that of Europe. A monograph of the bee-eaters is one of his most important works, but that by which he is probably best known is *A History of the Birds of Europe*, a monographic work in eight quarto volumes, with colored plates (London, 1871–81). Mr. Dresser has been a member of the council of the Zoölogical Society of London, president of the Yorkshire Naturalists' Union, and secretary of the British Ornithologists' Union. F. A. Lucas.

Dreux, drö (anc. *Durocasses*): a town of France; department of Eure-et-Loir; on the river Blaise; about 50 miles W. S. W. of Paris and 22 miles N. of Chartres (see map of France, ref. 3–E). It has a fine Gothic church, a town-hall, a theater, and manufactures of serge, woolen hosiery, hats, etc. Within the precincts of the old half-ruined castle of the twelfth century, which crowns the hill overlooking the town, a chapel of great magnificence was begun in 1816 by the Dowager-Duchess of Orleans, and completed by Louis Philippe. Here the Roman Catholic army, led by Constable Montmorenci, defeated the Prince of Condé and the Huguenots Dec. 19, 1562. Pop. (1896) 9,718.

Drew, Daniel: capitalist; b. in Carmel, Putnam co., N. Y., July 29, 1797; began active life as a cattle-drover; became conspicuous as a steamboat-builder, still later in connection with railways, especially in the fortunes and misfortunes of the Erie road, and at last was recognized as a leader in the stock speculations of Wall Street. He was also distinguished for liberality to certain educational interests of the Methodist Episcopal Church, having founded the Drew Ladies' Seminary at Carmel, N. Y., and the Drew Theological Seminary (*q. v.*). D. in New York city, Sept. 18, 1879.

Drew, John: actor; b. Sept. 3, 1825. He first appeared at the Bowery theater, New York, in 1845, as Dr. O'Toole in *The Irish Tutor*. After acting for some time in Albany, N. Y., he went to Philadelphia, where he became a favorite and was manager of the Arch Street theater in that city in 1853, in conjunction with William Wheatley. He acted in the principal cities of the U. S., and afterward visited England and Australia. He returned to the U. S. in 1862, and retired from the stage May 9 of that year. As an Irish comedian Drew had few equals. D. in Philadelphia, May 21, 1862. B. B. V.

Drew, John: actor; b. in Philadelphia, Nov. 13, 1853; son of John and Louisa Drew; educated at the Episcopal Academy in that city; made his first appearance at the Arch Street theater, Philadelphia, Mar. 22, 1872, in the character of Plumper in *Cool as a Cucumber*. He played many and varied parts for two years, and on Feb. 17, 1875, appeared at the Fifth Avenue theater as Bob Ruggles in *The Big Bonanza*. Then followed the long run of *Pique*, and a short season of Shakspeare at the same theater with Edwin Booth, playing such parts as Rosencrans in *Hamlet*, France in *King Lear*, and other minor *rôles* in the tragedian's repertory. During the temporary retirement of Augustin Daly from the theater in America during the season of 1878–79, Drew traveled through the country playing Henry Beauclerc in *Diplomacy*. The opening of the new Daly's theater in New York in 1880 found Drew again a member of the company, where he remained until 1892, visiting Europe with Daly's company, creating many parts in original plays, and playing in Shaksperean, Sheridanian, and other classic *rôles*. In the autumn of 1892 he began his career as a star in a comedy translated from the French of Bisson, called in English *The Masked Ball*. B. B. Vallentine.

Drew, Samuel: Wesleyan theologian and metaphysician; b. at St. Austell, Cornwall, England, Mar. 6, 1765; was a shoemaker; settled in London in 1819. He was an intimate friend of the famous Dr. Adam Clarke, and of Dr. Thomas Coke, the first American Methodist bishop, whose *Life* he wrote. Among his other works, the principal are *Essay on the Immateriality and Immortality of the Soul* (1802); *Essay on the Identity and General Resurrection of the Human Body* (1809); and *History of Cornwall* (1820–24). D. at Helston, Mar. 29, 1833. See his *Life* by his son, J. H. Drew (London, 1834; 2d ed. 1835; abridged ed. 1861).

Drew Theological Seminary, an institution founded in 1866 by the liberality of Daniel Drew, of New York. Its object is to train young men for the ministry of the Methodist Episcopal Church. The seat of the seminary is Madison, N. J., 25 miles from New York. The seminary park contains 95 acres of land, a portion of which is ornamented with walks and drives, trees and shrubbery. On the northern side of the seminary park are the buildings, four in number. Over $275,000 were spent by Daniel Drew in the purchase of these grounds, the erection of the necessary additional buildings, and in securing the valuable collections of books that now compose the library. The Cornell Library Building, entirely fire-proof, cost $80,000. The library itself is large and is rapidly growing. The institution was formally opened for students Nov. 6, 1867. The course of study occupies three years, and is adapted to the needs and attainments of college graduates. The general conference of the Methodist Episcopal Church in the U. S. has the direction and supervision of the faculty, seminary, and the theological instruction and education therein, constituting the bishops of the Methodist Episcopal Church as its board of supervision, and thus virtually controlling the management of the seminary. The Rev. Dr. John McClintock was the first president of the seminary and the organizer of its course of study, and was succeeded by Rev. R. S. Foster, D. D. Dr. Foster was elected bishop in 1872, and was succeeded by Rev. J. F. Hurst, D. D., as president. Dr. Hurst was elected bishop in 1880. His successor in the presidency was Rev. Henry A. Buttz, D. D. For the encouragement of advanced scholarship two fellowships are endowed. Those who hold them have the privilege of studying either at the seminary or in foreign lands. John F. Hurst.

Dreyse, drī'ze, Johann Nikolaus, von: inventor of the needle-gun; b. at Sömmerda, in Prussia, Nov. 20, 1787; the son of a locksmith; worked in a Paris gun-factory 1809–14; after his return to Germany established an iron-ware factory in Sömmerda, and devoted his attention chiefly to the improvement of firearms. He perfected the famous Needle-gun (*q. v.*) in 1836, and in 1841 he established an extensive gun and ammunition factory. D. Dec. 9, 1867.

Drift, or **Glacial Drift**: certain detrital deposits of distant origin, for a long period unexplained, but now known to have been produced during the Pleistocene period through the agency of glaciers. The most characteristic deposit is *till* or *bowlder clay*, an indiscriminate mixture of fine and coarse material, usually without lamination or bedding. The fine stuff, constituting a sort of matrix, is usually clay, but sometimes sand. The coarse stuff, imbedded in the fine,

ranges from grains, pebbles, and cobbles to bowlders of great size—occasionally many yards in diameter—and is characterized by worn surfaces, with groups of parallel scratches, and often with facets flattened by grinding. Usually the fragments differ in character from the rock on which the deposit rests, and it is often demonstrable that the parent beds from which they were torn lie many miles away. From this fact the bowlders are called *erratics*. Associated with the till are usually gravels and sands, likewise of distant origin, but more or less stratified and assorted as by the action of running water. In some regions broad tracts are covered by laminated clays including scratched pebbles and bowlders like those in till, and these deposits are ascribed to bodies of water in which icebergs floated.

The superficial forms of drift are no less characteristic than its material. As *ground moraine* the till mantles the land unequally, and presents a gently undulating surface. As *marginal moraine* it is heaped in irregularly disposed hills and hillocks which inclose undrained hollows, and these hills are grouped in belts one or more miles broad and of great length, tracing on the face of the country curved and more or less escalloped figures, and outlining the boundaries of the ice at various times. It also forms *drumlins*, isolated oval or lens shaped hills of symmetric form, trending in the direction of ice-motion. The assorted drift, gravel, and sand constitutes *kames*, or irregular grouped hills similar to moraine hills; *kame plains*, or plains diversified by abrupt kettle-shaped depressions and margined by kames; *frontal aprons*, or sloping alluvial plains on the outer flanks of marginal moraines; and *osar*, or long narrow ridges trending in the direction of ice-motion; besides other rarer features. The laminated clay with stones has the smooth surface characteristic of lacustrine and marine deposits. See GLACIERS, PLEISTOCENE, and GEOLOGY. G. K. GILBERT.

Drill: See BLASTING.

Drill: an old English word for ape; supposed by Huxley to be the source of the name *mandrill* (i. e. a man-like ape), but the latter word appears to be the original one. (See MANDRILL.) The term drill is applied especially to the *Cynocephalus leucophæus*, a baboon of Africa.

Drill, Military: the instruction of soldiers and the exercises through which they are required to pass. See TACTICS, MILITARY.

Drip: in architecture, the same as CORONA (*q. v.*).

Dris'ler, HENRY, LL. D.: scholar; b. Dec. 27, 1818; graduated at Columbia College in 1839; classical instructor in its grammar school for several years; appointed tutor of the Greek and Latin languages in the college, 1843; adjunct professor in the same department, 1845; Professor of Latin, 1857; transferred to the chair of Greek on the death of Dr. Anthon, 1867; in the same year was acting president of the college during President Barnard's absence as a commissioner to the Exposition Universelle in Paris. He again became acting president in 1888, and was dean of the School of Arts 1889–94. D. in New York, Nov. 30, 1897. Prof. Drisler was for several years engaged with Dr. Anthon on his classical text-books, etc. His contributions to classical learning are an enlarged edition of Liddell and Scott's Passow's *Greek Lexicon* (1846), co-operation in the seventh Oxford edition (1883), and revision of Yonge's *English-Greek Lexicon* (1870); general editor of Harper's Classical Series.

Driver, SAMUEL R.: See the Appendix.

Drogheda, dro*kh*'*e*-da: a seaport-town of Leinster, Ireland; on the boundary between the counties of Louth and Meath, and on the river Boyne, 4 miles from its entrance into the sea, and 25 miles N. of Dublin; lat. 53° 44′ N., lon. 6° 12′ W. (see map of Ireland, ref. 8–I). The Dublin and Belfast Railway here crosses the Boyne by a viaduct 95 feet high. The town has a Roman Catholic cathedral, several convents, and a custom-house, and manufactures of cotton and linen fabrics, steam-engines, etc. Vessels of 400 tons can ascend the river to this port, from which grain, cattle, linen, hides, butter, and ale are exported, mostly to Liverpool. Drogheda was formerly a town of great importance, the meeting-place of several parliaments, among them that at which Poyning's laws were enacted in 1495, and the chief military station of Leinster from the fourteenth century to the seventeenth, but it is, above all, noted as the place of a massacre by Cromwell in 1649. After a brief but courageous resistance he captured it, and put to the sword all the inhabitants, except thirty, who escaped, but were afterward captured and transported to Barbados. Pop. (1891) 11,812.

Drohobicz, drō'hō-bitch: a town of Austria, in Galicia; on a tributary of the Dniester; 18 miles S. E. of Sambor (see map of Austria-Hungary, ref. 3–K). It has a castle, two handsome churches, a monastery, and extensive salt-works. Pop. (1890) 17,784.

Droit d'Aubaine, drwăă'dō'bān': the right of a sovereign to inherit the property of a foreigner dying intestate without native-born heirs. This practice was abolished in 1790, but was restored by Napoleon I. See INTERNATIONAL LAW.

Droit'wich (anc. *Salinæ*): a town of Worcestershire, England; on the Bristol and Birmingham Railway; 7 miles N. N. E. of Worcester (see map of England, ref. 10–G). It derives its prosperity chiefly from its trade in salt, for which it has been famous from remote times. Here are brine-springs rising from a depth of 200 feet through new red sandstone, and yielding annually about 100,000 tons of salt, said to be the best in Europe; also saline baths which are visited by thousands annually. Pop. (1891) 4,021.

Drölling, drö'ling, MICHEL MARTIN: historical painter; b. in Paris, Mar. 7, 1786; pupil of his father, Martin Drölling, a genre-painter; studied also with David, and took the Grand Prix de Rome; member of the Institute 1833; Legion of Honor 1837. He was the master of several of the great French painters of the present day. His works are classical in style. There is a ceiling by him in the Louvre. D. in Paris, Jan. 9, 1851. W. A. C.

Drôme, drōm: a department in the southeastern part of France; area, 2,519 sq. miles. It is bounded W. by the river Rhône, and drained by the Drôme. The surface is partly hilly and mountainous. Coal, copper, iron, lead, and marble are found here. The highlands are covered with forests of oak, pine, beech, and chestnut. Among the staple productions are grapes, olives, chestnuts, silk, and wine of excellent quality. The wine called L'Hermitage is celebrated. Drôme is intersected by the Lyons and Avignon Railway. Capital, Valence. Pop. (1891) 306,419; (1896) 303,491.

Dromedary [from Late Lat. *dromeda'rius*, deriv. of *dromas* = Gr. δρομάς, -άδος, running (i. e. running camel); cf. δραμεῖν, to run]: the Arabian and African camel (*Camelus dromedarius*), a species differing from the Bactrian camel in having only one hump on the back. It has also more slenderness

Dromedary, or Arabian camel.

and symmetry of form. Its usual pace is a trot, which it often maintains for many hours together at the rate of 9 miles an hour. The dromedary surpasses other camels in speed, and can travel several days without drink. It is extensively used as a beast of burden in Africa and Arabia. See CAMEL.

Drongo-shrike: any bird of the family *Dicruridæ*, a group of fly-catching birds related to the crows, inhabiting Africa, Southern Asia, and some of the adjoining islands. The drongos are about the size of an American robin, of a blue or metallic blue-black color, with long forked tails, the outer feathers of which are in some species curved outward and have a racket-shaped termination. F. A. LUCAS.

Drontheim: See TRONDHJEM.

Dropping Tube: in chemistry, a slender tapering tube open at both ends, but terminating at the lower in a narrow orifice, used to supply liquids in delicate experiments, drop by drop. A bulb to hold the liquid is blown near the upper

extremity. The flow is regulated by placing the finger on the open upper end, so as partially or entirely to close it.

Dropsy [for Early Eng. *ydropsie* < O. Fr. *hydropisie* < Lat. *hydropisis*, from a deriv. of Gr. ὕδρωψ, dropsy (cf. ὑδρωπίασις), deriv. of ὕδωρ, water]: a condition characterized by excess of the natural fluid in any of the serous cavities of the body or in the areolar tissue. Dropsy was formerly thought to be a disease, but it is now recognized as a symptom of many diseases, caused for the most part by disturbances of the circulation of the blood or other vascular derangements. If the cerebro-spinal fluid be increased, it constitutes *hydrocephalus*, or "water on the brain." If the excessive secretion (exudation) takes place from the pleura, it is called *hydrothorax*, or "dropsy of the chest." If the fluid collect in the abdominal cavity, the disease is called Ascites (*q. v.*), a disease which may arise without assignable cause, but which most frequently comes from cirrhosis of the liver, a contracted, hardened condition of that organ, mechanically obstructing the portal circulation, and thus leading to transudation of serum from the blood-vessels. Habitual intemperance is its most frequent cause. General dropsy of the serous and areolar tissues is called *anasarca* (from Gr. ἀνά, throughout + σάρξ (gen. σαρκός), flesh). Obstructive organic disease of the heart and degenerative diseases of the kidneys are the most frequent causes of general dropsy, which is therefore a very important symptom. *Hydropericardium*, or "water on the heart," *hydrarthrus*, or effusion into a joint, *hydrorachis*, which is seated in the spinal canal, and *hydrocele*, in the scrotum, are forms of dropsy. Ovarian dropsy is a fluid collection occurring in ovarian cysts, which may be unilocular (of one sac) or multilocular (composed of many aggregated cysts), the whole frequently forming a mass of enormous size. Thus far its only successful treatment consists in the removal of the cysts by excision, one of the boldest, and, on the whole, one of the best, of the more recent surgical operations. Revised by William Pepper.

Droschky, or **Droshky** [a Slavic word, Polish *drozhka*, Russ. *drozhki*, dimin. of *drogi*, carriage, which has passed into most European languages; cf. Germ. *Droschke*, Swed. *droska*]: originally a low four-wheeled Russian carriage in which the passenger sat astride a seat placed lengthwise, with his feet resting on steps, to which were fastened fenders which curved over the wheels. When other forms of public conveyances were introduced into St. Petersburg, the name was transferred to them, and it is now applied in both Russia and Germany to a fiacre or other comfortable public carriage resembling a victoria.

Dros'era [from Gr. δροσερός, dewy]: a genus of perennial herbaceous plants of the family *Droseraceæ*, popularly called sundew, several species of which are natives of the U. S. and of the United Kingdom. From the glands of the leaves exude drops of a clear fluid glittering like dewdrops; hence the name. When flies or other small insects light upon a leaf they are held by the sticky fluid of the glands; the leaves then roll down from the apex and eventually surround the insect. It is pretty certain that the insect is digested and absorbed by the leaf. Revised by Charles E. Bessey.

Drosom'eter [from Gr. δρόσος, dew + μέτρον, measure]: an instrument for measuring the quantity of dew which falls upon the surface of an exposed body. It is in the form of a balance; the body under observation is supported by one arm, while the weights are placed in a scale-pan attached to the other, and protected from the dew.

Droste-Hülshoff, dros'te-hül'shōf, Annette Elisabeth, von: German poet; b. near Münster, Jan. 12, 1797. Her works (*Gedichte*, 1838; *Letzte Gaben*, 1859) show deep sentiment, powerful diction, and rich imagination. No woman of modern times in Germany has excelled her in poetry. D. May 24, 1848, at Meersburg. See Levin Schücking, *Annette von Droste* (2d ed. 1871). Julius Goebel.

Droste zu Vischering, dros'te-tsu-fish'e-ring, Clemens August, von, Freiherr: ecclesiastic; b. at Vorhelm, near Münster, Prussia, Jan. 21, 1773; became vicar-general in 1807; assistant bishop of the diocese of Münster in 1827, and Archbishop of Cologne in 1835. In consequence of difficulties with the Prussian Government in regard to mixed marriages, which the archbishop forbade the priests to solemnize unless they received the promise that all the children should be brought up in the Catholic religion, he was imprisoned in the fortress Minden in 1837 but was released in 1841. His imprisonment called forth an extraordinary excitement in Germany, and greatly strengthened the Roman Catholic Church. D. in Münster, Oct. 19, 1845. See his *Life* by F. A. Muth (Würzburg, 1874).

Drouet, droo'ā', Jean Baptiste, Comte d'Erlon: general; b. in Rheims, France, July 29, 1765; fought in the campaigns of 1793–96; general of brigade in 1799; won praise by his skill at Ulm and Hohenlinden, but especially by his brilliant manœuver which is said to have decided the victory at Jena (1806); was conspicuous in the siege of Dantzic; severely wounded at Friedland (1807), but afterward served with distinction in the Peninsular war. He was trusted and honored by the Bourbons, but soon disgraced on account of suspected treachery. On Napoleon's return from Elba he succeeded in capturing and holding the fortress of Lille for the emperor, who made him a peer of France. In the campaign ending at Waterloo Drouet commanded the First Army-corps. On the day of Ligny and Quatre Bras he wasted the time in which he might have been of inestimable service to Ney in a fruitless march between the two battle-fields through a misapprehension of Napoleon's orders. This unfortunate mistake brought upon him the keenest reproach. When Paris fell he fled to Bavaria, but returned to France in 1830, and was placed in command of the army of Vendée in 1832. He was governor-general of Algeria 1834–35, and in 1843 was raised to the rank of marshal. D. Jan. 25, 1844. F. M. Colby.

Drouyn de Lhuys, droo'ăn'de-lü-ee', Édouard: diplomatist; b. in Paris, France, Nov. 19, 1805. He was appointed director of the commercial bureau in the ministry of foreign affairs in 1840. Having voted in the Chamber of Deputies against the ministry, he was removed from office in 1845. He was Minister of Foreign Affairs in the first cabinet of Louis Napoleon in 1848, and was sent as minister to London in 1849. He was again appointed Minister of Foreign Affairs in July, 1852, resigned in 1855, and was restored to that position in Oct., 1862. He again resigned in 1866. D. in Paris, Mar. 1, 1881.

Drown, Thomas Messinger, M. D.: chemist; b. in Philadelphia, Mar. 19, 1842; graduated in 1859 at the Philadelphia High School; studied at the University of Pennsylvania, where he graduated as M. D. in 1862; at the Sheffield Scientific School, New Haven, 1862–63; at the Lawrence Scientific School 1863–65; and at Freiberg and Heidelberg 1865–68. He was Professor of Analytical Chemistry in Lafayette College for seven years, and held a similar position in the Massachusetts Institute of Technology from 1885 to 1895, when he became president of Lehigh University.

Drowning: death by submersion in water or the like. The following rules for the recovery of persons after apparent death from drowning are derived from the experience of the best physicians: (1) It is necessary in all cases to keep the body cool until respiration be re-established, since the application of warmth (both in frozen and nearly drowned persons) seems to arouse those dormant energies that absolutely require the aëration of the blood, which failing, death ensues. (2) Respiration must be artificially established, either by direct inflation of the lungs by the breath or the bellows, or, much better, by the "Marshall Hall method" or some of its modifications. The patient being in a horizontal position to facilitate the exit of water from the lungs, and the head being slightly raised, the lungs are alternately inflated and compressed by gently rolling the body from a prone to a half-prone position (upon one side), and reversing the process. The lungs may also be inflated by retracting the arms with some force, and by pressure upon the thorax. (3) Expose the face and chest to the air, unless the weather be very cold. (4) Rub the limbs upward, and as soon as dry clothing can be procured put it upon the patient. (5) Avoid the use of the galvanic battery, which is always dangerous, even in experienced hands. (6) Continue these operations until, if possible, natural respiration be re-established. Cases are reported where artificial respiration had to be kept up for hours before signs of life appeared. Similar treatment should be employed in all cases of so-called "asphyxia" from whatever cause. See Resuscitation.

Drowning, as a capital punishment, was formerly practiced in various parts of the Old World. In the Anglo-Saxon codes women convicted of theft were condemned to be drowned. The ancient Burgundians condemned a faithless wife to be smothered in mud. This form of punishment was common in the Middle Ages, and seems to have been principally inflicted upon women. It was not abolished in Scotland till 1685, and in Austria it lasted till 1776.

Droyls'den: a village of Lancashire, England; on the Lancashire and Yorkshire Railway; 4 miles E. of Manchester (see map of England, ref. 7-G). It has extensive manufactures of cotton and several dye-works. Pop. (1891) 9,482.

Droysen, droi'zen, Johann Gustav: historian and philologist; b. in Treptow, near Berlin, Prussia, July 6, 1808. He received his academic training in Berlin, where he became privat docent in 1833 and professor extraordinary in 1835. Five years later he went to Kiel, and thence to Jena, the outbreak of the revolution in 1848, in which he took a prominent part, making his stay in Kiel undesirable. In 1859 he returned to Berlin as Professor of History, where he remained till his death, June 19, 1884. Droysen commanded an extraordinarily wide field of study. His most important publications are *Geschichte Alexanders des Grossen* (1833; 3d ed. 1880); *Geschichte des Hellenismus* (2 vols., 1836); *Leben des Feldmarschalls Grafen York* (1851); *Geschichte der Diadochen*; *Geschichte der preussischen Politik*; celebrated metrical translations of *Æschylus* and *Aristophanes*. See M. Dunker, *Biogr. Jahrb.*, vii. (1884), pp. 110–118. Alfred Gudeman.

Druids [of Celtic origin; cf. O. Fr. *drui*, aeeus. *druid*, magician, sorcerer; possibly connected with word for oak; cf. Welsh *derw*, O. Fr. *daur*, Gr. δρῦς]: the priests of the ancient Celtic religion. In Cæsar's time they formed an exclusive class, which shared with the nobility and the knights the rule over the people, and were free from taxes and from military service. They presided at the sacrifices, instructed the youth, and guarded the secret doctrines of religion. They acted as judges in the difficulties between different tribes, and exercised the art of prophecy and of sacred minstrelsy. They were also skilled in medicine, in astrology, the division of time, and other branches of knowledge, which were kept secret from the masses of the people. They recognized a ruling destiny and the immortality of the soul, and reverenced the oak and mistletoe as sacred. Their political importance ceased on the subjection of Gaul and Britain to the Romans, and their religious service was abolished by a decree of the Emperor Claudius because of its feature of human sacrifices. There were also druidesses of several ranks. Of the druidical doctrines little is known. See d'Arbois de Jubainville, *Introduction à l'étude de la littérature celtique* (Paris, 1883); Rhys, *Celtic Heathendom* (London, 1888).

Druids, Order of: a secret benevolent and beneficial association, founded in London in 1781 and originally intended for the mere mutual entertainment of its members. A system of ceremonies was adopted similar to that of the Freemasons, but professedly based on traditions handed down from the ancient Druids. As the society extended, many changes were introduced, and the original organization in course of time was divided into a great number of independent Orders of Druids. The oldest branch of the society holds its sessions in London. Another branch, calling itself the Order of Druids in England, is very numerous in that country, having more than 1,000 lodges. The whole number of members belonging to the different orders in Great Britain, Australia, and the U. S. is estimated at above 100,000. The first lodge in the U. S. was founded in New York in 1839. There are in the U. S. 15 grand groves, 300 groves, and over 15,000 members. Since 1849 over $5,000,000 has been paid in benefits. In North America, besides the degree conferred at the first entrance, there are five others. Degrees have also been instituted in Great Britain, but they differ from those used in the U. S. Though of purely English origin, the German element in the Order of Druids has obtained a decided preponderance in the U. S., so that nearly if not quite two-thirds of the "groves" conduct their proceedings in the German language.

Drum: a martial musical instrument, consisting of a hollow cylinder of wood or metal having skin or parchment stretched across one or both ends, on which the drummer beats with a wooden stick called a *drum-stick*. The military drum is used to give various signals, as well as for music. There are three kinds of drums—the *side* drum, the big or *bass* drum, and the *kettle* drum. The first of these is suspended at the side of the drummer, who beats on one end of it only. Strings of catgut, called *snares*, are stretched across the other end; hence it is often called a *snare* drum. The bass drum is beaten on both ends. The kettle drum is of hemispherical form, and has but one head or parchment. It was formerly used in martial music, but is now confined to the orchestra. In its orchestral use at least two kettle drums are used (rarely three), tuned at intervals of fourths or fifths apart, sometimes in octaves, as in Beethoven's scherzo in the Ninth Symphony.

Drum, in architecture, the upright part of a cupola below the carving or rounded part. The solid part or vase of a Corinthian or composite capital beneath the acanthus leaves is also called a drum, though more often a *bell*. The term drum is applied in machinery to a hollow cylinder fixed upon a shaft for the purpose of driving another cylinder by a band.

Drum, the name given in the eighteenth century to a crowded fashionable assembly, so styled, says Smollett, "from the noise and emptiness of the entertainment." A large assembly of the kind was called a "drum-major." The name "kettle-drum" applied to an informal afternoon reception appears to have originated in the nineteenth century.

Drumfish: a marine fish (*Pogonias chromis*) belonging to the family *Sciænidæ*; found on the Atlantic coast of America from Cape Cod to Brazil. A similar species (*Aplodinotus grunniens*) occurs in the Great Lakes and the Mississippi river. The drumfish derives its name from the emission of a peculiar sound, somewhat resembling the beat of a drum, and thought to be caused by the movement of the air in its complicated air-bladder. A similar power is possessed by most other members of the *Sciænidæ*.

Drumgoole, John C.: See the Appendix.

Drumlin: in geology, a smooth oval hill composed of till. The name, first applied in Ireland, was afterward introduced in America, where it supplanted "lenticular hill" and "mammillary hill." The contours and profiles of drumlins are smooth curves, attributed to the modeling power of glacial ice. Their tops are rounded; their sides are frequently steep, but merge gradually with surrounding surfaces. Their contours are oval, sometimes long and narrow, sometimes nearly circular. The longer diameter always lies in the direction of the ice movement. Where the hills are grouped together, the groups frequently constitute belts running parallel to neighboring terminal moraines. The till of which they are chiefly constituted is thoroughly compacted, and is supposed to have been deposited by the Pleistocene ice-sheets from their under surfaces. In the U. S. they are especially abundant in New England, Western Central New York, and Eastern Wisconsin. See Drift and Pleistocene. G. K. G.

Drummond, Henry, F. R. S. E., F. G. S., LL. D.: scientist and theologian; b. in Stirling, Scotland, in 1851. He studied at Edinburgh and at Tübingen, Germany, giving his attention first to theology and afterward to the natural sciences. In 1877 he became professor extraordinary and in 1884 Professor of Natural Science in the Free Church College, Glasgow. In 1883–84 he was engaged in exploration in Central Africa. He lectured on religious, scientific, and sociological subjects in Great Britain, the U. S., Canada, and other English-speaking countries. He published *Natural Law in the Spiritual World* (London and New York, 1883); *Tropical Africa* (London, 1888); *The Ascent of Man* (1894), and several widely influential minor religious works, mostly collected in *The Greatest Thing in the World, and other Addresses* (1893). Most of these works have been translated into German and other languages. D. at Tunbridge Wells, England, Mar. 11, 1897. Willis J. Beecher.

Drummond, Josiah Hayden: b. at Winslow, Me., Aug. 30, 1827; A. B., Waterville College (now Colby University), 1846; LL. D. 1871; served three terms in the House of Representatives, twice as Speaker; State Senator; and four terms attorney-general of Maine. Mr. Drummond has been for many years prominent in Masonic circles, and is author of *Maine Masonic Text-book for Use of Lodges*. C. H. T.

Drummond, Thomas: engineer; b. in Edinburgh, Scotland, in Oct., 1797. He was well versed in mathematics and skillful in mechanics. He was one of the royal military engineers employed in the trigonometrical survey of Scotland. In 1825, while engaged in this operation, he made successful experiments with incandescent lime to render distant objects visible. (See Drummond Light.) He was appointed undersecretary for Ireland in 1835. D. in Dublin, Apr. 15, 1840.

Drummond, William (of *Hawthornden*): poet; b. at Hawthornden, near Edinburgh, Scotland, Dec. 13, 1585; was educated at Edinburgh University and studied law in France. He resided on his beautiful paternal estate of Hawthornden, where he passed his life in retirement and

in literary pursuits. In 1619 Ben Jonson traveled several hundred miles in order to visit Drummond, who wrote *Notes of Ben Jonson's Conversation* on this occasion. These notes are among his most interesting productions. He was author of *Tears on the Death of Mœliades* (1613); *Poems* (1616); *Forth Feasting* (1617); *Flowers of Zion* (1623); besides a *History of the Five Jameses*, and some political tracts. D. Dec. 4, 1649.

Drummond Island: an island in Lake Huron; the most western of the Manitoulin islands; belongs to Michigan. It is 20 miles long and 10 miles wide.

Drummond Light [named from Thomas Drummond, its inventor], also called **Lime Light, Calcium Light**, etc.: an intense light produced by throwing the oxyhydrogen blowpipe flame upon a pencil of lime, which is thereby raised to vivid incandescence. If magnesia or metallic magnesium be used instead of lime, the light is rich in actinic rays, and hence is useful in photography. Zirconia is often employed instead of lime, on account of its non-volatility.

Drunkenness: See DIPSOMANIA and INTEMPERANCE; also CIVIL DAMAGE ACTS.

Drupe [Fr. *drupe* < Lat. *druppa*, ripe olive, apparently an abbreviated form of Gr. δρυπεπής, ripened on tree, or δρυπετής, ready to fall]: in botany, a one-celled, superior indehiscent fruit, having a single seed or kernel, usually inclosed in a hard and bony *endocarp* called a stone, as a peach or a plum. The outer part of the fruit, which is succulent or fleshy, is called the *sarcocarp* or *mesocarp*. The term *putamen* is applied to the hard, stony substance which incloses the kernel.

Dru'ses: a people of mixed race (largely Persian and Arab), almost limited to the Lebanon and the Hauran; speaking the Arabic language. They number nearly 90,000. They are industrious, hospitable, brave, temperate (all are required to abstain from tobacco and wine), cleanly, and very proud of their birth and pedigree, but revengeful and cruel. Their chief business is the production and manufacture of silk. For about 800 years they have maintained a distinct religion and an independent nationality. Their creed is an offshoot of Mohammedanism, probably developed by the Shiites, or more especially by the so-called Batiniya, or Batenians, the most radical branch of the Shiites. In some of its fundamental tenets, however, it is directly opposed to the very spirit of Mohammedanism, and seems to approach Christianity. It emphasizes the unity of God as strongly as Mohammedanism. "There is no god but God," the Druses say, and he is unknowable to man. But, though he can not be grasped by the senses, he becomes known to man through revelation, they add; and then follows a doctrine of incarnation not altogether unlike the Christian doctrine, but an abomination to all Mohammedans. The highest, and also the last, of these incarnations was, according to the Druses, that of Hakim Biamrillahi, the sixth of the Fatimites, caliph from 1019 to 1044. Hakim was a half-insane tyrant; and when his favorite, Ismail Darasi, a Persian by birth, one day in 1040 began to expound to the audience assembled in the great mosque of Cairo that Allah had revealed himself in Hakim, that Hakim was an incarnation of Allah, a riot immediately ensued, and it could not be suppressed until Darasi was expelled from the country. He went to the regions of the Lebanon, and his doctrine was accepted by the people living there; hence their name Druses. But though the new sect thus formed even developed a literature, its later history is very obscure. Externally, the Druses saw fit to profess Mohammedanism, and nothing was known about their peculiar creed and their sacred books until the latter part of the eighteenth century. A bloody war between them and the Maronites led, in 1860, to European intervention on behalf of the Christians. See MARONITES. See also the Earl of Carnarvon's *Druses of the Lebanon* (London, 1860); Rev. John Wortabet, *Researches into the Religions of Syria* (1860); H. Guyo, *La théogonie des Druses* (Paris, 1863); and *La nation Druse* (Paris, 1864); and particularly C. H. Churchill, *Ten Years' Residence in Mt. Lebanon* (3 vols., 1853); *The Druzes and the Maronites under the Turkish Rule from 1840 to 1860* (1862); Laurence Oliphant, *Land of Gilead* (1880) and *Haifa* (1887).

Revised by SAMUEL MACAULEY JACKSON.

Dru'sus, CLAUDIUS NERO: a Roman general; b. in 38 B. C.; son of Tiberius Nero and Livia (who subsequently became the third wife of the Emperor Augustus), and a younger brother of the Emperor Tiberius. He married Antonia, a daughter of Mark Antony. In 13 B. C. he defeated the Germans near the Rhine. Having conquered the Sicambri and Frisii, he extended the Roman empire to the German Ocean and to the river Elbe. For these victories he received the surname of GERMANICUS. He died early in 9 B. C., leaving two sons, Germanicus and Claudius, the latter of whom became emperor.

Drusus, MARCUS LIVIUS: a Roman orator and politician: became tribune of the people in 122 B. C. as a colleague of Caius Gracchus. He supported the cause of the senate and optimates, opposed the policy of Gracchus, and gained popularity by planting colonies. He was elected consul for 112 B. C.

Drusus, MARCUS LIVIUS: a son of Marcus Livius Drusus and an uncle of Cato Uticensis. He is said to have been ambitious, proud, and arrogant, and a champion of the senatorial or aristocratic party. Having been chosen tribune of the people for 91 B. C., he courted the popular favor by passing an agrarian law. Unable to win the support of the senate, he attempted to gain the support of the colonies by promising them the right of citizenship. He was assassinated by a political opponent in 91 B. C.

Dry Bank Light: a lighthouse on the Florida Reef; situated on Sombrero Shoal, near Dry Bank, Coffin's Patches, and Sombrero Key; in lat. 24° 37′ 36″ N., lon. 81° 6′ 43″ W. It is an open framework of iron 149 feet high, with a fixed white dioptric light of the first class.

Dryden: village; on railway; Tompkins co., N. Y. (for location of county, see map of New York, ref. 5–F); 32 miles N. of Owego. It has a large woolen-factory, a tannery, and sulphur springs. Here is the Dryden Spring Place, a resort for invalids. Pop. (1890) 663; (1900) 699.

Dryden, JOHN: poet; b. at Aldwinckle, Northamptonshire, England, Aug. 9, 1631: a grandson of Sir Erasmus Driden, created a baronet in 1619. He was a pupil of Dr. Busby, and entered Trinity College, Cambridge, in 1650. Having graduated as master of arts in 1657, he became a resident of London. He wrote *Heroic Stanzas on the Death of Cromwell* (1658), and celebrated the restoration of Charles II. in 1660 by a poem entitled *Astræa Redux*. His first drama was *The Wild Gallant* (1662). He married Lady Howard, a daughter of the Earl of Berkshire, in 1663, and wrote in 1667 a poem called *Annus Mirabilis, or Year of Wonders*. In 1668 he was appointed poet-laureate, with a salary of £200 annually. He afterward wrote numerous comedies and tragedies, among which are *Marriage à la Mode*, *All for Love* (1678) and *Aurungzebe*. His brilliant political and poetical satire of *Absalom and Achitophel* (1681) is directed against the party of which Lord Shaftesbury and the Dukes of Buckingham and Monmouth were the leaders. He announced his conversion to the Roman Catholic religion by his allegorical poem called *The Hind and the Panther* (1678). He produced in 1696 a metrical translation of Vergil, which Pope commended as "the most noble and spirited translation I know in any language." It is, however, deficient in fidelity. Among his other works are an excellent prose *Essay on Dramatic Poesy* (1660) and an *Ode for Saint Cecilia's Day*. His later works exhibit a purer taste than his dramas. D. May 1, 1700, and was buried in Westminster Abbey. See ENGLISH LITERATURE.

Dry Dock: See DOCKS.

Drying-machine: a device for extracting the moisture from fabrics. A machine most commonly used by dyers and large laundry establishments, called an "extractor," consists of two cylinders, one within the other. The inner one is the receptacle for the goods, and is made to revolve with great rapidity, expelling the water through perforations made in the sides. The outer cylinder receives the water, and from thence it is carried off by means of a pipe. By this process the drying is not quite complete, but what remains is expelled by drying in a hot chamber or in the open air.

Drying Oil: in painting, oil which has the property of drying quickly; especially linseed oil and other seed oils. The process of drying is hastened by heating the oil with oxide of lead. See OILS and PAINTS.

Dryobalanops: See CAMPHOR.

Dry'ophis [from Gr. δρῦς, oak + ὄφις, serpent]: a genus of snakes belonging to the *Colubridæ*, natives of tropical America and the East Indies. Like the *Dendrophidæ*, to which they are allied, they have extremely slender, elongated forms,

and live on trees. They are sometimes placed with other related genera in a separate family. F. A. L.

Dry Pile: a kind of voltaic pile or battery, constructed without liquids, and furnishing a feeble electric current. The dry piles of Zamboni and De Lue consist of disks of copper and zinc papers placed in pairs back to back and piled up or packed in glass tubes, with the copper surfaces all in the same direction.

Dry Point: in engraving, engraving done directly on the copper, by the etching-needle, and without acid. Prints taken from plates so engraved are much prized. See ENGRAVING.

Dry Process: See PHOTOGRAPHY.

Dry-rot: a popular term used to designate the slow decay of wood after it has been dried or seasoned. The term is used technically to distinguish the work of certain fungi, particularly of *Merulius lacrymans*. It is a common opinion that this disease proceeds most rapidly in perfectly dry timber, but this is an error. The mycelium of the fungus is quickly destroyed when the wood is made perfectly dry. Under all ordinary conditions, however, there is sufficient moisture in timber exposed to the air to supply the needs of the fungus. The spores germinate on the surface of damp timber, and the filaments pass through the walls of the wood-cells and feed upon them. Wood which is thoroughly well seasoned and is protected from dampness by paint or other means is secure from the injuries of the dry-rot fungi. Among horticulturists dry-rot is the slow decay of the heart-wood of fruit-trees, due to the mycelium of various toadstool and punk fungi, which gain an entrance through some wound or break in the surface of the trunk. L. H. B.

Dry-stove: a glazed structure designed for the protection of the plants of dry, arid climates; a hothouse in which the air is kept less moist than in the bark-stove. It is particularly adapted to succulent plants. The temperature should be higher than that of a greenhouse.

Dry Tortu'gas [from Sp. *tortuga*, a tortoise]: a group of ten small, low, barren islands, belonging to Monroe co., Fla., situated over 40 miles W. of the most western of the Florida keys proper. On the southwesternmost island, called Loggerhead Key, stands a brick lighthouse 150 feet high, with a fixed white dioptric light of the first order; lat. 24° 38′ 5″ N., lon. 82° 52′ 53″ W. There is also a smaller light for Dry Tortugas harbor (lat. 24° 37′ 47″ N., lon. 82° 52′ 53″ W.). This lighthouse stands inside Fort Jefferson, an important fortification on Garden Key. The Dry Tortugas served as a place of imprisonment for persons under sentence by courts martial during the civil war 1861–65. Several criminals concerned in the conspiracy in which President Lincoln was murdered were confined here.

Du'alin [deriv. of *dual*, from Lat. *dua'lis*, containing two; *duo*, two; so called because it is a mixture of two different substances]: an explosive compound introduced in 1868 by Dittmar; composed of NITRO-GLYCERINE (*q. v.*) mixed with sawdust, or wood-pulp such as is used in paper-mills; the latter being first treated with nitric and sulphuric acids. The object of the mixture is to diminish the danger connected with the storage and transportation of nitro-glycerine. See EXPLOSIVES.

Dualism [from Lat. *dua'lis*, containing two; *duo*, two]: in metaphysics, the doctrine that the universe exists by the concurrence of two principles, the spiritual and the material, each necessarily independent and eternal. The "dualism" of Zoroaster belongs rather to religion than to philosophy. It assumed two independent principles—one good, the other evil—through the collision of which was explained the disorder, moral and physical, of the world. The Gnostics in the second century adopted these views in a greater or less degree. The Greek philosophers are called dualists, inasmuch as the most of them held to the belief that matter and spirit were each self-existent and independent in origin. Their statements of the doctrine differ from each other, and are vague and indistinct. But the Stoical doctrine of a soul of the world, contradistinguished from matter without qualities (Gr. ἄποιος ὕλη), represents the general drift of the Greek thought. The prevailing mode of thought among Christian theists recognizes the real being of mind and matter in the constitution of man and the order of the universe, while it attributes self-existence and creative power solely to the Supreme Mind. In connection with theories of perception the term dualism has been used to denote the soul and the modes of matter in relation and opposition while the mind is in the act of acquiring knowledge of the external world. See Hamilton's edition of Reid's works, p. 817.

Dual Number: in grammar, that form of the noun, adjective, or verb denoting in some languages the number two. For example, in the ancient Greek there were three numbers in grammar, the singular, the dual, and the plural; but the dual was not very often used, and is never found in Æolic or in Hellenistic Greek. It occurred most frequently in the Attic dialect.

Duane, dyu-ān′, JAMES: lawyer; b. in New York, Feb. 6, 1733. He was a member of Congress 1774–77 and 1780–82; the first mayor of New York in 1784, and U. S. district judge 1789–94. D. at Duanesburg, N. Y., Feb. 1, 1797.

Duane, JAMES CHATHAM: U. S. military officer; b. at Schenectady, N. Y., June 30, 1824; graduated at West Point in 1848, and Jan. 10, 1883, became a colonel of engineers. He served throughout the civil war, taking part in many important engagements and receiving the brevet rank of colonel for his services in the Richmond campaign and of brigadier-general for the gallantry and skill displayed in the siege of Petersburg and subsequent operations. He served in the construction of the defenses of the eastern entrance to New York harbor 1865–68; member of engineer boards 1867–73; became lighthouse engineer of the Northeast Atlantic coast and superintendent of the fortifications at Maine and New Hampshire. In 1886 he became chief of engineers, with rank of brigadier-general. Retired June 30, 1888. He was commissioner Croton aqueduct, New York, from Aug. 1, 1888, till his death, in New York, Nov. 8, 1897. Author of *A Manual for Engineer Troops* (1862).

Duane, WILLIAM JOHN: lawyer and statesman; b. at Clonmel, Ireland, in 1780; son of William Duane, an American journalist; practiced law in Philadelphia, and published, besides other works, *The Law of Nations Investigated in a Popular Manner* (Philadelphia, 1809). He was appointed Secretary of the Treasury of the U. S. early in 1833, but was dismissed from office in September of that year by President Jackson, because he refused to remove the deposits of public money from the Bank of the U. S. D. in Philadelphia, Sept. 27, 1865.

Duarte Coelho: See COELHO.

Duban, dü'bäañ′, JACQUES FÉLIX: architect; b. in Paris, France, Oct. 14, 1797. He was the pupil of Debret and of the École des Beaux-Arts. He was made inspector of that school in 1832, and soon afterward began the reconstruction of its buildings upon a larger plan. He continued in charge until his death. In connection with Lassus he restored the Sainte Chapelle in Paris. The restoration of the Château of Blois is one of his most important works. D. at Bordeaux, Oct. 12, 1870.

Du Barry, MARIE JEANNE GOMARD DE VAUBERNIER, Comtesse: favorite of Louis XV.; b. of humble parents at Vaucouleurs, France, Aug. 19, 1746: went to Paris as a dressmaker, but her beauty and cleverness attracted the notice of the dissolute Jean, Comte Du Barry, who made her his mistress. Noting the admiration she excited among the guests of his house he brought about her presentation to the king, then sixty years old but still the slave of his vices. In spite of the protests of relatives and advisers Louis at once gave himself up to her influence, and caused her introduction at court by her marriage to Guillaume, Comte Du Barry (1769), the brother of her former patron. From this time her ascendency over the king was absolute; she had the whole court at her feet, caused the dismissal of the Duc de Choiseul, who attempted to resist her power, and with her confidant, the Duc d'Aiguillon, she controlled the entire policy of the government. On the death of the king (1774) she was banished from the court, but allowed to remain in her palace at Luciennes. In 1792 she went to London to sell her jewels, and on her return to France in the following year she was tried on the charge of having squandered the public treasures, conspired against the Government, and while in London worn mourning for the late king. She was condemned Dec. 6, 1793, and guillotined on the same day. The amount of the public money that went to gratify the vanity of the Comtesse Du Barry and advance the interests of her family is estimated at 35,000,000 francs, but some credit is due to her for her liberality toward artists and men of letters. F. M. COLBY.

Du Bartas, dü'bäär'taa′, GUILLAUME SALLUSTE: poet; b. at Montfort, in the department of Gers, 1544; undertook various diplomatic missions to foreign courts for the Hugue-

not cause; fought in the Huguenot army, and died from a severe wound in the battle of Ivry, Mar. 14, 1590. His fame rests upon two epic poems, the second unfinished, entitled *La Sepmaine* (The Week) and *La seconde Sepmaine*. The first, which is far the better of the two, describes the creation of the world; the second, the period from the creation to the incarnation of Christ. These poems were very popular in France and much read in England. In 1598 Joshua Sylvester translated the poems into English. They were also partially done into English by Th. Hudson, William Lisle, and Th. Winter. See Georges Pellissier, *La Vie et les Œuvres de Du Bartas* (1883).

Revised by A. R. Marsh.

Dubbs, Joseph Henry, D. D.: historical and ethnographical writer and worker; b. at North Whitehall, Pa., Oct. 5, 1838; graduated at Franklin and Marshall College 1856, and at the Mercersburg Theological Seminary 1859. After several pastorates in the Reformed Church in the U. S., he became, in 1875, Professor of History and Archæology in Franklin and Marshall College, Lancaster, Pa. He is a member of various ethnographic and historical societies in Great Britain, France, and America, and has published *Historic Manual of the Reformed Church* (Lancaster, Pa., 1885); *Home Ballads and Metrical Versions* (Philadelphia, 1888); *Why am I Reformed?* (Philadelphia, 1889); and a large number of historical monographs, addresses, and contributions to encyclopædias. He edited *The Guardian*, a monthly magazine, 1882–86. Willis J. Beecher.

Du Bellay: See Bellay.

Dublin: a county of Leinster, Ireland; area, 354 sq. miles; bounded on the E. by the Irish Sea, and intersected by the river Liffey, which flows into Dublin Bay. The surface is nearly level; the soil is productive and well cultivated. Granite, copper, lead, and carboniferous limestone occur here. Chief town, Dublin. Pop. (1891) 429,111.

Dublin: city; capital of Ireland and of Dublin county; on the Liffey, at its entrance into Dublin Bay; 66 miles W. of Holyhead and 135 miles W. of Liverpool; lat. 53° 20′ 38″ N., lon. 6° 17′ 30″ W. (see map of Ireland, ref. 9–J). Mean annual temperature, 49° F. The river, which runs eastward, divides the city into two nearly equal parts, which are connected by nine bridges—seven of stone and two of iron. In the northeastern and southeastern parts are many beautiful squares, streets, and terraces, occupied by the aristocratic class. The mercantile business is mostly transacted in the central and northwestern portions, where are many residences of the middle class. The city is surrounded by the Circular Road, nearly 9 miles long, which is a favorite drive and promenade of the citizens. The most imposing street of Dublin is Sackville Street, 120 feet wide and 700 yards long. Among the numerous squares is Stephen's Green, having an area of nearly 20 acres. The most remarkable public buildings are the Bank of Ireland (formerly the Parliament House), Trinity College, the custom-house, the Four Courts, Dublin Castle, occupied by the Lord-Lieutenant, and St. George's church with a steeple 200 feet high. The cathedral of St. Patrick is one of the most interesting buildings of the city. It was founded in 1190 by John Comyn, Archbishop of Dublin. In the next century it was burnt down, but was immediately rebuilt in still greater splendor. At the time of the Reformation it was closed, and Edward VI. thought of using the building for a university, but the plan was defeated. Near the north end of Sackville Street is a monument to Lord Nelson, 134 feet high. Among the literary and scientific institutions are the University (see Dublin, University of), the Royal College of Science, the Roman Catholic University, the College of Surgeons, the Royal Dublin Society, the Royal Irish Academy, the Hibernian Academy for Paintings, and the National Gallery. Dublin is the seat of a Protestant Episcopal and a Roman Catholic archbishop. In the environs of Dublin, which are remarkably beautiful, is Glasnevin, once the favorite residence of Addison, Steele, Swift, and Sheridan; and Phœnix Park, which contains nearly 2,000 acres. The fine scenery of this noble park, the massive public buildings, the spacious squares, the clean granite quays which line the river, and the beauty of the bay which expands before the city, render Dublin one of the most beautiful and agreeable capitals of Europe. Railways extending in several directions connect this place with the chief towns of Ireland. It is the eastern terminus of the Grand and Royal Canals, and has a good harbor, which has been improved by the construction of two breakwaters. This city has glass-works, foundries, and distilleries; also manufactures of poplin, which is much celebrated. Dublin returns four members to Parliament, besides two who represent the university. It is a very old town, and its ancient history is mainly legendary. It was taken in the ninth century by the Danes, and, though they were several times expelled, and completely defeated in the battle of Clontarf, they managed to hold the city until 1170. In 1172 Henry II. landed in Ireland at the head of an Anglo-Norman armament. He went to Dublin, held his court there with great magnificence, and made an alliance with the Irish chiefs. In 1689 James II. took up his residence in Dublin and held a parliament there; after the battle of the Boyne he speedily departed. On Jan. 1, 1800, the imperial standard of the United Kingdom was hoisted on Dublin Castle. Pop. (1891) 254,709 in the city proper, but 361,891 within the metropolitan police district.

Dublin, University of (otherwise called **Trinity College, Dublin**): an institution of learning, said to have been founded in 1320; re-established in 1593 by Queen Elizabeth. It was endowed by the corporation of Dublin and by private gifts, and still further by grants of James I., who in 1613 gave it representation in Parliament, which it still possesses, sending since 1832 two members to the House of Commons. Its government is modeled upon that of the English universities, but its fellows (since 1840) are at liberty to marry. It has a full corps of professors in all departments of knowledge, who, like the fellows, are liberally supported from the income of the college. The students are of four classes: (1) Noblemen, baronets, and the sons of noblemen, who have peculiar privileges, and, with the exception of baronets, obtain the degree of B. A. without examination. They pay about $500 a year in fees. (2) Fellow-commoners, who dine with the fellows, and have one less examination than the third class, at about one-half the cost in fees of the preceding. (3) Pensioners, to which class most of the students belong. Their fees are little more than half as great as those of the second class. (4) Sizars, thirty in number, who pay a nominal fee. Each of the ranks wears a distinctive dress. The examination on entrance is thorough. It is possible to obtain degrees without great exertion, but the honors can be obtained only by severe study. No restriction is made with regard to the admission of those who are not members of the Anglican Church. The fees for graduation are much higher than in American colleges. Dublin University occupies a high rank among European institutions of learning. It has special departments for the study of medicine, divinity, and engineering. Among the eminent graduates were Berkeley, Ussher, Swift, Burke, Goldsmith, Sheridan, and Sir W. Hamilton. An unsuccessful attempt made Mar. 11, 1873, in the British Parliament to unite the Catholic University, Magee College, Belfast, and the Queen's Colleges of Cork and Belfast to the University of Dublin, and to abolish the Queen's College at Galway, led to the temporary disruption of the Gladstone ministry.

Dübner, düp'ner, Friedrich: classical philologist; b. in Hörselgau, Germany, Dec. 20, 1802; professor at the Gymnasium of Gotha 1826–31. After 1831 lived in Paris, where he superintended Didot's new edition of the Greek *Thesaurus* of Stephanus. Subsequently he became the chief editor of Didot's *Bibliotheca Græca*, for which great undertaking he himself contributed the scholia to Aristophanes, Theocritus, the *Anthologia Palatina*, Theophrastus, Plutarch's *Moralia* and the *Fragmenta et spuria*. At the direction of Napoleon III. he prepared a critical edition of *Cæsar* (Paris, 1867). For the *Collection Elzévirienne* of the same firm he wrote the commentaries to Horace and Vergil. He is also the author of numerous school editions, a Greek grammar, and a Greek-French lexicon. He died in Montreuil-sous-Bois, near Paris, Oct. 13, 1867. See Eckstein, *Allgemeine deutsche Biographie*, v., 440 ff.

Alfred Gudeman.

Dubnitza: same as Dupnitza (*q. v.*).

Dubois, doo-bois': borough and railway junction; Clearfield co., Pa. (for location of county, see map of Pennsylvania, ref. 4–D); 127 miles N. W. of Pittsburg. The chief industries are coal-mining and lumbering. Pop. (1880) 2,718; (1890) 6,149; (1900) 9,375.

Du Bois, Augustus Jay, C. E., Ph. D.: Professor of Engineering; b. at Newton Falls, O., Apr. 25, 1849; graduated at the Sheffield Scientific School of Yale College in 1869; received the degree of C. E. in 1870 and that of Ph. D. in

1873. Subsequently he studied mining at Freiberg, in Saxony. From 1875 to 1877 he was Professor of Civil and Mechanical Engineering in Lehigh University; from 1877 to 1884 Professor of Dynamical Engineering in the Sheffield Scientific School of Yale College: and since 1884 Professor of Civil Engineering in the same institution. He is the author of *Elements of Graphical Statics* (1875); *The New Method of Graphical Statics* (1875); and *Strains in Framed Structures* (1883; 8th ed. 1892); and valuable papers in engineering journals. He translated Weisbach's *Hydraulics and Hydraulic Motors* (1877); Weyrauch's *Iron and Steel Structures* (1877); Weisbach's *Theory of the Steam-engine* (1878); and Roentgen's *Thermodynamics* (1880). He has delivered and published several lectures on the relations of science to faith, to the supernatural, and to immortality.

Dubois, dü'bwăă', Clément François Théodore: organist; b. at Rosny, France, Aug. 24, 1837; studied in the Paris Conservatory, and gained many prizes, among them the Prix de Rome in 1861; was appointed *maître de chapelle* of Ste. Clotilde in 1867, where he produced his oratorio *Les Sept Paroles du Christ*. He has composed several operas and operettas, but his fame rests on his organ-playing and his numerous and important organ compositions. Since 1877 he has been organist of the Madeleine, Paris, having succeeded Saint-Saëns there. In 1883 he was decorated with the order of the Legion of Honor. D. E. Hervey.

Dubois, Guillaume: ecclesiastic and politician: b. at Brives-la-Gaillarde, Limousin, France, Sept. 6, 1656. He was preceptor to the Duc de Chartres, who became Duke of Orleans and Regent of France in 1715. Having gained the favor of this prince by pandering to his vices, he was appointed a councilor of state. He exhibited much political cunning and talent for intrigue. Among his important diplomatic acts was the treaty between France, England, and Holland called the Triple Alliance (Jan., 1717). He became about 1718 Minister of Foreign Affairs, and, though his morals were depraved, Archbishop of Cambray in 1720, and cardinal in 1721. He was appointed Prime Minister in 1722, and retained power until his death, Aug. 10, 1723. See C. L. Sevelinges, *Mémoires secrets et correspondance inédite du Cardinal Dubois* (Paris, 2 vols., 1815); Seilhac, *L'Abbé Dubois* (2 vols., 1862); Fontaine de Rambouillet, *La Régence et le Cardinal Dubois, relations anecdotiques* (1886).

Dubois, Paul: sculptor and portrait-painter; b. at Nogent-sur-Seine, France, July 18, 1829; one of the greatest artists of the French school; pupil of Toussaint; has received the highest honors at exhibitions in Paris and elsewhere for sculpture and painting; member of the Institute 1876; commander Legion of Honor 1886. One of his best works in painting is *My Children* (1876). His sculptured busts are admirable. Among his finest works in sculpture are *The Child St. John* (1863; the four figures for the tomb of Gen. de la Moricière at Nantes (1875); *Narcissus* (1873); and *Jeanne d'Arc* (1889). Several works are in the Luxembourg Gallery. Studio in Paris.

Du Bois-Reymond, dü'bwăă'rā'mōn', Emil: physiologist; b. in Berlin, Prussia, Nov. 7, 1818; in 1858 succeeded his teacher, Johannes Müller, as professor at the university there, and became a member of the Academy of Sciences, of which he became secretary in 1867: published the *Archiv für Anatomie* (in connection with Reichert) 1857–77; and since then the *Archiv für Physiologie*. He is widely known for his researches in animal electricity. Author of *Untersuchungen über tierische Elektrizität* (2 vols., 1848–84); *Ueber die Grenzen des Naturerkennens* (6th ed. 1884); *Gesammelte Abhandlungen zur allgemeinen Muskel- und Nervenphysik* (2 vols., 1875–77); *Reden* (2 vols., 1886–87). D. Dec. 26, 1897. Revised by S. A. Torrance.

Dubovka, doo-bov'kăă: a town of European Russia; government of Saratof; on the river Volga; 180 miles S. S. W. of Saratof (see map of Russia, ref. 9–F). It has manufactures of leather, tallow, soap, and tobacco; an active trade by the river, and an annual fair lasting a month. Pop. 13,500.

Dubs, Jakob: Swiss statesman and publicist; b. at Affoltern, canton of Zürich, July 26, 1822; studied law at Berne, Heidelberg, and Zürich. After holding several important offices in his native canton, he became a member of the federal court in 1855, and in 1857 its president. In 1864 he was president of the confederation, and again in 1870. His policy was liberal and progressive. D. at Lausanne, Jan. 13, 1879. Among his works are *Die Schweizer Demokratie in ihrer Fortentwickelung* (1866) and *Das öffentliche Recht der Schweizerischen Eidgenossenschaft* (1877–78).

F. M. Colby.

Dubuc, Joseph: Canadian jurist; b. at St. Martine, P. Q., Dec. 26, 1840; graduated at McGill University in 1869. He removed to Manitoba in 1870; has been a member of the executive council, attorney-general, and Speaker of that province; and in 1878 was elected to the Parliament of Canada. In 1879 he was appointed judge of the court of queen's bench. He was a commissioner to investigate rights claimed by settlers on the Red and Assiniboine rivers, and a member of the council of Manitoba University.

Neil Macdonald.

Dubufe, dü'büf', Claude Marie: genre and portrait painter; b. in Paris, France, 1790. Pupil of David; first-class medal, Salon, 1831; Legion of Honor 1837. Style classical and work mediocre. *The Surprise* is in the National Gallery, London; *Portrait of General Montesquiou-Fezensac* (Versailles Museum). D. in Paris, Apr. 24, 1864.

W. A. C.

Dubufe, Édouard: figure and portrait painter; b. in Paris, Mar. 30, 1820. Pupil of his father, C. M. Dubufe, and of Paul Delaroche. First-class medal, Salon, 1844; second-class, Paris Expositions, 1855 and 1878; officer Legion of Honor 1869. His portraits are showy but well drawn; his decorative work is of considerable importance. *Congress of Paris* is in the Versailles Museum; *Portrait of Émile Augier* (an excellent work) is in the Luxembourg Gallery, Paris. D. at Versailles, Aug. 11, 1883.

W. A. C.

Dubufe, Édouard Marie Guillaume: figure and portrait painter; b. in Paris, May 16, 1853. Pupil of his father, Édouard Dubufe, and of Mazerolles; second-class medal, Salon, 1878; first-class medal, Paris Exposition, 1889; Legion of Honor 1889. Among his important works are *St. Cecilia* (1878) and *Sacred Music and Profane Music* (1882). He painted the ceiling in the public foyer of the Théâtre Français, Paris. His work is notable for good technical qualities. Studio in Paris. W. A. C.

Dubuque, doo-byuk': city; capital of Dubuque co., Ia. (for location of county, see map of Iowa, ref. 4–K); situated opposite the point where the line between Wisconsin and Illinois reaches the Mississippi river, and occupying 13 sq. miles of plateau and bluffs on the west bank of the Mississippi river; 337 miles N. of St. Louis, 247 miles S. of St. Paul, and 147 miles W. of Chicago. In 1900 it was the second city in size in Iowa. Four railways center here—the Ill. Cent., Ch., Mil. and St. Paul, Ch. Gt. West., and the Ch., Bur. and No. (C., B. and Q.). Dubuque is the headquarters for the only packet line on the Mississippi river, and also has the boatways and harbor set apart by the Government for the wintering of boats. The city is connected with the opposite shore of the Mississippi by three bridges.

Institutions, Churches, and Schools.—The city has a public library, a court-house, a custom-house, a Roman Catholic orphan asylum, asylum for the insane, Roman Catholic and Protestant hospitals, is the seat of the federal court for the northern district of Iowa, of a Roman Catholic archbishoprie, and contains 24 Protestant churches, 7 Catholic churches, 13 Roman Catholic colleges, academies, and parochial schools, a Lutheran seminary, and the German Presbyterian Theological School of the Northwest, 10 public schools, including a high school, and several private schools. There are two parks, many beautiful private residences on the terraced bluffs, and 27 miles of electric railways. The manufacturing interests are represented by about 300 establishments, with a capital of $10,000,000, and giving employment to more than 5,000 persons. The products include sashes, doors, and blinds, wagons, steel-hulled steamboats, carriages, steam-engines, boilers, mortising-machines, water-wheels, water-works appliances, hardware novelties, and other special machinery, boots and shoes, leather, pumps and plumbing goods, furniture, tobacco, paint, paper, linseed oil, and brick; there are situated here three pork-packing houses, iron and brass works, and the Ch., Mil. and St. P. repair-shops. The lead-mining industry, which before 1857 was the principal one, has been revived, and zinc-works have been established. The assessed valuation of property in 1900 was $24,000,000.

The city was named after Julien Dubuque, a French trader, who, with others, settled here in 1788 to work the

mines of lead: this settlement, which was the first in what is now the State of Iowa, was abandoned after Dubuque's death in 1810, and the site was not again occupied until 1833, when the first permanent settlement in Iowa was made here by miners. Pop. (1860) 13,000; (1880) 22,254; (1890) 30,311; (1900) 36,297.

City Editor of "Telegraph."

Duc, dük, Joseph Louis: architect; b. in Paris, France, Oct. 15, 1802. He was the pupil of Percier, and studied at the École des Beaux-Arts. In 1840 he was made architect of the Palais de Justice on the island, in Paris, and the great works connected with this continued almost until his death. D. in Paris, Jan. 22, 1879.

Du Cange, dü'kaañzh', Charles du Fresne: historical writer and lexicographer; b. at Amiens, France, Dec. 18, 1610. He was liberally educated, and studied law. Among his most important works are *Histoire de l'empire de Constantinople sous les empereurs français* (Paris, 1657), the first part of which contains the text of Villehardouin's *Conquête de Constantinople* and extracts from Philippe Mousket's *Chronique rimée*; a *Glossarium ad Scriptores Mediæ et Infimæ Græcitatis* (2 vols. folio, 1688; n. e. Breslau, 1890–91); and a *Glossarium ad Scriptores Mediæ et Infimæ Latinitatis* (3 vols. folio, 1678, enlarged to 6 vols. folio in 1733–36, and reissued with additions, in 7 vols. quarto, in 1840–50, and again in 10 vols., Niort, 1883–87). He lived in Paris after 1668. D. there Oct. 23, 1688. In 1849 a statue was erected to him at Amiens, where he had lived up to 1668. See the essay upon him by H. Hardouin (Amiens, 1849); L. Feugère, *Étude sur la vie et les ouvrages de Du Cange* (Paris, 1852). Revised by E. S. Sheldon.

Du'cas, Michael (in Gr. Μιχαὴλ ὁ Δοῦκας): a Byzantine historian who flourished about 1450; related to the imperial family of Constantinople. He wrote a *History of the Fall of the Byzantine Empire*, covering the period from the death of John Palæologus VI. (1355) to the capture of Lesbos by the Turks (1462). This work is written in a barbarous style, but appears to be trustworthy (edited by Bekker for the Bonn series of Byzantine historians, 1834). D. after 1463.

Revised by A. R. Marsh.

Ducasse, Jean Baptiste: French naval commander and administrator; b. at Berne about 1640. He became a partner in the Senegal Company, and from 1678 to 1690 seems to have been principally engaged in shipping slaves from Africa to the West Indies; during this time he was twice captured by Dutch privateers and forced to pay high ransoms. In 1691 he was appointed governor of the French colony in Santo Domingo. He managed to repress the disorderly spirit of the buccaneers, who formed a large part of the colony, and in 1694 he employed them in an attack on the English at Jamaica, reducing that island almost to ruin. The English retaliated by ravaging the northern part of French Santo Domingo in 1695. In 1697 Ducasse commanded the land forces under De Pointis in a descent on Cartagena, one of the richest towns in South America. The place was forced to capitulate May 2, and, though a heavy ransom had been paid, the houses were sacked and a rich booty obtained. During the peace with Spain Ducasse went to that country, 1700, and returned in command of a Spanish fleet, having in convoy the Viceroy of Mexico and troops for Cartagena. He was attacked by the English squadron of Benbow Aug., 1701, and sustained a running fight of four days, but escaped with little damage. Returning to France 1703, Ducasse did brilliant service in Spain during the war of succession, attaining the rank of lieutenant-general; in 1714 he commanded the naval forces in the attack on Barcelona. On account of ill health he resigned, and died in France, July, 1715. Herbert H. Smith.

Duc'at [O. Fr. *ducat*, loan from Ital. *ducato* (: Fr. *duché*), dukedom, ducat < Lat. *duca'tus*, command (Late Lat.), dukedom, or a Low Lat. deriv. of Ital. *duca* < Byz. Gr. δοῦκα, from Lat. *dux* (gen. *ducis*), a leader. The meaning ducat was probably due to a motto on a coin struck by Roger II. of Sicily as Duke of Apulia (twelfth century): "Sit tibi, Christe, datus, quem tu regis, iste *ducatus*" (To thee, O Christ, be given this duchy which thou rulest)]: a gold coin which originated in Italy and was afterward coined in several countries of Europe. In 1559 the ducat was adopted as a legal coin of the German empire. There was much difference in the value of the ducats which circulated in various countries. Those of Austria, Holland, and Hamburg contain about 52·8 grains of pure gold, and are nearly equivalent to two U. S. gold dollars. The Spanish silver ducat (*ducado*) is worth about one dollar. The ducat is said to have been first struck in the sixth century by Longinus, Duke or *duca* of Ravenna, but Gibbon attributes its origin to the Dukes of Milan.

Ducato, Cape: See Cape Ducato.

Duccio, doot'chō, **di Boninsegna**: a Siennese painter of whom little is known personally except that he was the head of the Siennese school in the latter part of the thirteenth and early part of the fourteenth centuries, contemporary with but older than Giotto. The little work by him that remains, so far as can be stated positively, is at Sienna and in the National Gallery at London, where there are three small pictures. At Sienna there is a Madonna and a series of stories from the life of Christ, in which is shown the purest feeling for the sacred dramatic art and a sentiment of harmony in composition which has been the inspiration of many later painters. His art had nothing to do with that of Cimabue, save as it is like that descended from the Byzantine. W. J. Stillman.

Duces tecum: in law, a phrase sometimes used as an abbreviation of *subpœna duces tecum*. See Subpœna.

Du Chaillu, dü'shaă'yü', Paul Belloni: a traveler; b. in Paris, France, July 31, 1835; son of a French merchant in Equatorial Africa; naturalized as a citizen of the U. S. He explored the Gaboon region, etc., and published, besides other works, *Explorations and Adventures in Equatorial Africa* (1861); *A Journey to Ashango Land* (1867); *My Apingi Kingdom* (1871); *Wild Life under the Equator*; *Lost in the Jungle*; *The Country of the Dwarfs*; *Land of the Midnight Sun* (1881); *Age of the Vikings* (1889). He was the first white man to hunt the gorilla (1856), though specimens living and dead had been secured earlier (1851) by Dr. Henry A. Ford, of the Gaboon mission. Du Chaillu's fame is chiefly founded on his introduction of the gorilla to the knowledge of the general civilized public.

Duchâtel, dü'shaă'tel', Pierre (Lat. *Castellanus*): ecclesiastic; b. in Burgundy, France, about 1500. He became a thorough Greek scholar; assisted Erasmus; was a proofreader at Basel; studied at Rome; traveled in the East; was made Bishop of Tulle by Francis I. 1539; Bishop of Mâcon 1544; Bishop of Orleans 1551; grand almoner of France 1547. He was a virtuous and tolerant prelate, and a zealous advocate of the interests of the Gallican Church. D. at Orleans, Feb. 2, 1552.

Duchesne, dü'shen', André: historian; b. in Touraine, France, May, 1584; became geographer and historiographer to the king. He wrote many valuable works, among which are *Historiæ Normanorum Scriptores Antiqui* (Ancient Historians of the Normans, 1619) and *Historiæ Francorum Scriptores cætani* (Contemporary Writers of the History of the Franks, 5 vols., 1636–41). D. near Paris, May 30, 1640.

Duchobor'zi (i. e. champions of the Spirit): a sect among the peasantry of Russia. They seceded from the Molokan sect in the eighteenth century, and are not very numerous. The sect was founded by one Ilarion Pobirochin, who taught the Trinity and the transmigration of souls, and considered himself, it is said, an incarnation of God. Their doctrinal system, however, is not well known, but their ethical teachings show a striking resemblance to those of Quakers, especially in their dependence upon an "inward light." They refuse to take oaths, to serve in the army, to partake of the sacraments, and they reject a sacerdotal class, a liturgical service, etc. They were banished in consequence to the regions near the Sea of Azof. In 1841 they were exiled to the Trans-Caucasus, where they are now chiefly found.

Du'cie, Earls of (United Kingdom, 1837): Barons Ducie (England, 1763), Barons Moreton (United Kingdom, 1837). —Henry John Reynolds Moreton, third earl, P. C., F. R. S., b. June 26, 1827; was M. P. for Stroud 1852–53, and succeeded his father June 2, 1853.

Ducis, dü'sēs', Jean François: poet; b. at Versailles, France, Aug. 22, 1733; devoted himself entirely to poetry; declined the seat in the senate which Napoleon offered, and lived in deep retirement in his native city. Of his original works, the tragedy *Abufar* (1795) became very celebrated, but he is best known from his having translated and arranged for the French stage *Hamlet* (1769), *Romeo and Juliet* (1772), *Lear* (1783), *Macbeth* (1784), *King John* (1791), and *Othello* (1792). D. at Versailles, Mar. 31, 1816.

Duck [connected with verb *to duck*: Germ. *tauchen*]: the popular name for many waterfowl of the family *Anatidæ*, typified by the common duck *Anas boscas*. In a general way ducks are distinguished from geese on the one hand and the mergansers on the other by a broad, flattened bill, short legs, and scaled tarsi. There are about 150 species, grouped in two sub-families, the river ducks (*Anatinæ*) and sea ducks (*Fuligulinæ*), the former without, the latter with a flap or lobe on the hind toe. The members of these groups are by no means so restricted in their habitats as the popular names might seem to indicate, the fresh-water species going to the sea and *vice versa*. The ruddy duck and its allies are sometimes placed in a group apart (*Erismaturinæ*) on account of the long, narrow tail feathers, and the tree ducks (*Dendrocygna*), which have leanings toward the geese, are occasionally classified with those birds. There are ducks in nearly all parts of the globe, the species being most numerous in warm regions, the individuals in cold climates. The species inhabiting the temperate zones usually migrate north or south (according to the hemisphere they reside in) in spring to their breeding-places, while in winter they assemble in vast flocks. Male ducks are generally larger and handsomer than the females, and have a peculiar bony enlargement of the windpipe just above the bronchi. The majority of species nest on the ground, some in holes, while a few build in hollow trees or even among the branches. The eggs are from six to sixteen in number, the period of incubation three to four weeks; the young are clothed with down and run about as soon as hatched. Most ducks fly well, and some are estimated to make from 60 to 90 miles an hour, the old squaw (*Clangula hyemalis*) of the Atlantic coast of North America being one of the swiftest. On the other hand, at least one species, the steamer-duck (*Tachyeres cinereus*) of South America, is flightless in its adult form, although it flies when young, the growth of the wings not keeping pace with that of the body. In the cold regions of the north ducks and their eggs form important articles of food, while their skins and the down used for lining their nests are made into garments.

The different breeds of domesticated ducks, with the probable exception of certain varieties in China and the neighboring countries, are all descended from the mallard. In domestication ducks become polygamous, although they always live in pairs when wild. The male also ceases to care for his offspring, and even the females are sometimes not good mothers, so that it is always better to hatch ducks' eggs under a hen. The eggs, owing to their somewhat rank taste, are less prized than those of the hen, but the flesh of some breeds, such as the Aylesbury duck, is considered a great delicacy.

Ducks seem to have been domesticated at a comparatively recent date, for they were unknown to the Egyptians, and Roman writers of the first century speak of the necessity of keeping them covered with netting to prevent their escape. The mandarin-duck of China, the *Aix galericulata*, a near relative of the summer duck of the U. S., is regarded in China as an emblem of conjugal affection. F. A. Lucas.

Duckbill, or **Water-mole**: a monotrematous mammal (*Ornithorhynchus anatinus*) of Van Diemen's Land and Australia. It deviates less from the birds than any other mammals except the Tachyglossidæ (*q. v.*). The duckbill is the only animal of its genus. It is about 15 inches long, with a brown fur. It has a sort of horny tooth near the base of each jaw or mandible, and the males have spurs on the hind legs. The female has no nipple, but the young (which are hatched from eggs and are at first very slightly developed) draw their milk through a slit-like opening.

Duckbill: *Ornithorhynchus*.

This animal inhabits ponds and quiet streams, where it swims about on the surface of the water with its head somewhat elevated, often diving for its food, which consists of insects and other small aquatic animals. It climbs trees with facility, and is sometimes seen in small groups on the limbs of trees near the water. It digs a burrow, often 30 feet long, in the river-bank, with one opening above and another below water. This burrow is projected in a serpentine course into the bank and ascends toward its termination, and at the end is built the nest, which is composed of dried grasses, leaves, weeds, etc., strewn over the floor. See Ornithorhynchidæ.

Ducking-stool: a contrivance formerly used in Great Britain and in some parts of the U. S. for the punishment of scolds. The most common form seems to have been that of a strong wooden chair attached to one end of a beam, which pivoted midway on a post planted in the ground at the edge of a pond or stream. The woman having been secured in the chair, the beam was worked up and down by a chain at the other end, and she was thus plunged into the water, or "ducked." The practice of ducking originated toward the close of the fifteenth century, and very generally prevailed in Great Britain until the early part of the eighteenth, and in some places even to the beginning of the nineteenth century.

Duck River: a river of Tennessee; rises in Coffee County; flows nearly westward through Middle Tennessee, and enters the Tennessee River in Humphries County. Length about 250 miles.

Duckweed: a small and usually floating plant, with unisexual flowers, without calyx or corolla, and with loose hanging roots. The duckweeds belong to the family *Lemnaceæ*, and are related to the arums. They are widely distributed over the world, and several species are found in the U. S., covering the surface of stagnant waters with their flat green fronds.

Duclerc, Charles Théodore Eugène: statesman; b. at Bagnères-de-Bigorre, France, Nov. 9, 1812; entered the office of *Le Bon Sens* in Paris, 1836, as a proof-reader, but soon rose to the position of editor; was on the staff of the *National* 1840–46, contributing a series of important financial articles. In the Revolution of 1848 he took an active part, displaying energy and bravery in the critical days of May and June. As representative to the National Assembly (1871) from the departments of the Landes and the Basses-Pyrénées, he led the Republican Left and figured prominently in debate. He was elected vice-president of the National Assembly in 1875, and senator for life Dec. 10 of that year. On Aug. 7, 1882, Duclerc became Premier, but his ministry was lacking in strength, and fell in Jan., 1883, on account of its persistent demand for the expulsion from French territory of princes who might be dangerous to the republic, and its refusal to consent to a compromise bill. D. July 21, 1888. F. M. Colby.

Duclos, dü'klō', Charles Pineau: author; b. at Dinan, France, Feb. 12, 1704; wrote several successful romances; admitted into the French Academy in 1747; appointed historiographer of France in 1753. Among his works are moral essays entitled *Considérations sur les Mœurs de ce Siècle* (Reflections on the Manners of this Century, 1750) and *Mémoires secrets sur les règnes de Louis XIV. et XV.* (Secret Memoirs of the Reigns of Louis XIV. and XV., Paris, 1791). D. in Paris, Mar. 26, 1772.

Ducrot, dü'krō', Auguste Alexandre: soldier; b. at Nevers, Feb. 24, 1817; educated at Saint-Cyr; appointed lieutenant in the army Dec. 27, 1840, and general of division June 7, 1865. After the battle of Sedan he declined those favors which the French officers could obtain on their word of honor, and was incarcerated at Pont-à-Mousson. He escaped and reached Paris. He commanded at Rueil, La Jonchère, and Buzenval, and partook in the various sorties. After the conclusion of peace he wished to retire to private life, but was appointed commander-in-chief of the Eighth Army-corps, stationed at Bourges. In poli-

tics he opposed every scheme for the re-establishment of the empire. He wrote *La Journée de Sedan*; *La Verité sur l'Algérie* (1871); *Observations sur le système de la défense de la France*; *Défense de Paris* (4 vols., Paris, 1875–78). D. in Paris, Aug. 17, 1882.

Ductility [Lat. *ducti'litas*, deriv. of Lat. *duc'tilis*, capable of being drawn, capable of extension; *du'cere*, draw]: capability of being drawn out into a long and slender form. The metals having the greatest ductility are gold, silver, platinum, aluminium, and iron. A grain of gold may be drawn into 500 feet of wire, and a wire of platinum not exceeding a 30,000th of an inch in diameter has been obtained by placing a fine wire of platinum in the axis of a larger silver wire, then drawing the compound wire in the usual mode, and finally dissolving the silver by nitric acid. The ductility of glass (when melted or heated to a red heat) is almost unlimited. The ductility of many bodies is modified by temperature.

Du Deffand, Marquise: See Deffand.

Dudevant, dü'de-vaăn', Madame: See Sand, George.

Dudley: municipal and parliamentary borough of England; in a detached part of Worcestershire and South Staffordshire; 9 miles W. N. W. of Birmingham (see map of England, ref. 10–G). It is well built, and is one of the chief seats of the iron-trade. Here are manufactures of glass, grates, fire-irons, nails, vices, chain-cables, etc. Near Dudley are the ruins of Dudley Castle, founded in 760 A. D. by Dudo, a Saxon prince. Mines of coal and iron and quarries of Silurian limestone are worked in the vicinity. Dudley returns one member to Parliament. Pop. (1891) 45,724; (1901) 48,809.

Dudley, Benjamin Winslow, LL. D.: surgeon; b. in Spottsylvania co., Va., in 1785; he began the study of medicine in Lexington, Ky., and took his degree in the University of Pennsylvania in 1806. He went to Europe in 1810, and during his four years of absence studied with Sir Astley Cooper, Abernethy, Cline, Larrey, Dubois, Boyer, Marjolin, and others. In 1817, in conjunction with Blythe, Caldwell, Brown, Richardson, Drake, etc., he organized the medical department of the University of Transylvania, which was long the leading school of medicine in the West. He became known as one of the most successful surgeons of his day, and is said to have performed lithotomy 225 times with but six deaths. D. at Lexington, Ky., Jan. 20, 1870.

Dudley, Charles Edward: U. S. Senator; b. in Staffordshire, England, May 23, 1780; emigrated to the U. S. in 1794. He was elected mayor of Albany in 1821, and a Senator of the U. S. for an unexpired term of four years in 1829. D. in Albany, Jan. 23, 1841. The Dudley Observatory at Albany, N. Y., was founded by his widow, who gave it $70,000.

Dudley, Edmund: minister of Henry VII. of England; b. about 1462; notorious for his extortions from the people in connection with his associate Empson, in order to gratify the king's avarice; became privy councilor, but was sent to the block by Henry VIII. Aug. 18, 1510. He was the father of John Dudley, who was created Earl of Northumberland in 1551. See Northumberland, John Dudley, Duke of.

Dudley, Henry Bate: journalist and dramatist; b. at Fenny-Compton, England, 1745. He was educated at Cambridge and destined for the Church, but devoted his time and energy chiefly to literature. In 1775 he founded the *Morning Post* and in 1780 the *Morning Herald*, both of which achieved a great and rapid success. Of his plays the most important are *Flitch of Bacon* (1779); *The Woodman* (1791); *The Blackamoor Washed White* (1776); and *The Travelers in Switzerland* (1793). He was an intimate friend of Garrick. D. in London, Feb. 1, 1824.

Dudley, Joseph: Colonial Governor; son of Thomas Dudley, deputy Governor of Massachusetts; b. in Roxbury, Mass., July 23, 1647. He was appointed chief justice of Massachusetts in 1686, chief justice of New York in 1690, and was Governor of his native province from 1702 to 1715. D. in Roxbury, Apr. 2, 1720.

Dudley, Paul, F. R. S.: lawyer; son of Joseph Dudley; b. Sept. 3, 1675; graduated at Harvard 1690, and studied law at the Temple in London. He was distinguished for eloquence and talents; became attorney-general of Massachusetts in 1702, and chief justice in 1745; founded the Dudleian Lectureship at Harvard College. D. in Roxbury, Jan. 25, 1751.

Dudley, Thomas: Colonial Governor; b. at Northampton, England, in 1576; served in Holland in Queen Elizabeth's army, and in 1630 went to Boston as deputy Governor of Massachusetts Bay under his son-in-law, Governor Bradstreet. He held the office twelve years. He was Governor of the colony in 1634, 1640, 1645, and 1650, and became major-general in 1644. D. July 31, 1653, at Roxbury, where he left an estate long held by his descendants.

Dudley, Thomas Underwood: bishop; b. in Richmond, Va., Sept. 26, 1837; graduated at the University of Virginia; served in the Southern army during the civil war; studied theology after the close of the war, and was ordained deacon in the Protestant Episcopal Church in 1867. He became rector of Christ church, in Baltimore, in 1869; was chosen assistant Bishop of Kentucky in 1874, and in 1884 became bishop of the diocese.

Duel [Fr. *duel*: Ital. *duello*, based upon *duellum*, the Old Lat. form of *bellum*, which was adopted into Romance on the pedantic but mistaken presumption that the word implied a contest between *two* (*duo*); the word may be connected with Gr. δαΓΙς, battle, δήΓιος, hostile, or with Sanskr. *dvis-*, hate]: originally a trial by battle resorted to by two individuals, either for the purpose of determining the guilt or innocence of a person charged with a crime, or of deciding a disputed right; in more recent times a hostile meeting between two persons in consequence of an affront given by one to the other, and for the purpose of affording satisfaction to the injured party.

The practice of fighting duels as a means of deciding private differences seems to have originated, at a comparatively recent date, with the feudal system. The appeal to arms as an alternative to the trial by ordeal was placed under definite regulations by a code promulgated by Philippe le Bel, of France, in 1306. This same monarch, however, discouraged private duels.

In England, dueling does not appear to have prevailed until the latter part of the reign of Queen Elizabeth. At this period appeared the famous *Treatise of Honor*, by Vincentio Saviolo, a fierce and punctilious Italian. He was a fencing-master by profession. His work, published in 1594—now little known—appears to have been adopted as a standard book of reference in cases of supposed insult. Saviolo resolves all quarrels into the *lie*—that is, he supposes the original insult to be followed by a regular series of replies and retorts, until one of the parties is reduced to give the lie direct; which, like the phrase "stupid youth" in some German universities, was immediately followed by the appeal to arms.

Henry II. of France issued an edict in 1574 prohibiting the public or judicial combat. This decree was caused by the death of his favorite La Chataigneraye from wounds received in the lists. The public duel survived longer in Italy. Its abolition in France was not followed by the good effects which the statesmen of those days probably anticipated from it. Private duels, conducted with a sanguinary spirit before unheard of, became very prevalent. Brantôme gives instances of duelists who prided themselves on advantages which they had taken of their opponents, and were not less esteemed in society for having done so; there were said to be regiments in the same service, the officers of which were bound to fight one another whenever they met. Lord Herbert of Cherbury mentions the honor in which the French ladies held the brave Balagny, a man with neither wit, figure, nor fortune, but whose merit consisted in the fact that he had killed eight or nine of his friends in single combat.

In the reign of Henry III. the custom of the seconds taking part in the quarrels of their principals seems first to have been established—a custom which did not cease till the beginning of the eighteenth century. When such practices were rife in all parts of France we can scarcely doubt the extraordinary assertions of writers of those times—that 120 gentlemen were killed in duels in a single province in six months; that in the reign of Henry IV. 4,000 fell in two years; and that this mania cost France more gentle blood than thirty years of civil war. Henry IV. issued edicts against dueling: Louis XIII. proceeded against it with such severity that it is said wounded duelists were dragged from the field to the gibbet; but this extreme severity, as usual in such cases, appears to have had no good effect. In the minority of Louis XIV. the Duke de Nemours, a prince of the blood, fell, with two of his seconds, in a quarrel with another grandee. Soon after this many noblemen and gen-

tlemen of undoubted courage made a voluntary compact to abstain from dueling. This resolution was seconded by Louis XIV. when of age, in several edicts. It should be remembered to the honor of that monarch that he labored during his whole life to correct this abuse, and with considerable success. One of his expedients was the establishment of a court of chivalry, the Maréchaussée or Connétablie, the members of which were the marshals of France, which was to decide on all questions in which a gentleman might conceive his honor to be involved. French duels are generally supposed to have become rather farcical. Harmless enough, surely, were those of Gambetta and Fourton, who in 1878 fought on a foggy morning at a distance of forty paces, and of Gen. Boulanger and M. Fouquet, in 1888, in which the general "spitted" himself on the rapier of the retired attorney. Killing in duels in France is now punishable as homicide, and a civil action lies on behalf of the friends of the man who has been slain.

The first attempt made in Great Britain to introduce legislative enactments for the suppression of duels is said to have taken place in 1713, when, after the duel of the Duke of Hamilton with Lord Mohun, a bill for that purpose was brought into the Commons, but lost on the third reading. A challenge to fight is now a high misdemeanor. In Scotland as late, it would appear, as the middle of the sixteenth century, licenses for dueling were granted by the crown, and formed a source of revenue: killing in a duel without license was murder. In Germany duels are punishable with imprisonment in a fortress, yet in 1887 an officer was expelled from the army for refusing to challenge one who had insulted him! In no country were duels more prevalent formerly than in Ireland. In France the period of the restored monarchy (1815–48) was one of those in which duels were most rife, not only among the military, but among civilians; but since 1848 they have greatly diminished. In Great Britain a heavy blow was aimed at dueling in the army by a new article (the 98th) inserted in the articles of war of 1844, rendering it an offense punishable by cashiering. Duels are comparatively rare in Belgium, although the soil of that country is frequently chosen for the encounters between gentlemen from adjacent states.

The first duel in North America is said to have occurred at Plymouth, Mass., in 1621. The most famous duel in the U. S. was that between Aaron Burr and Alexander Hamilton, in 1804, in which the latter lost his life. Other notable duels were those between Henry Clay and John Randolph, Apr., 1826; between Andrew Jackson and Charles Dickinson, in which the latter was killed; and between Thomas H. Benton and Lucas, the latter being killed. In the U. S. by common law the survivor and the seconds are guilty of murder when one of the parties is killed. It is, moreover, not only made illegal by statute, but is forbidden in the army and navy by the articles of war. Notwithstanding all the efforts made to suppress dueling, it is noteworthy that the custom is still prevalent in some form, more or less serious, in all but the English-speaking countries.

The weapons usually employed in duels are the pistol and the sword, or rapier. In Scandinavian countries what was known as the "girdle duel" was formerly practiced, in which the two combatants were stripped, tied together by a girdle, and a knife given to each. They then fought until one or both succumbed. This duel is the subject of the famous statue on the quay at Stockholm. In Tibet it is reported that the two adversaries throw a white piece of metal and a black piece of metal into a caldron of boiling water, plunge their hands simultaneously at a given signal into the water, and the one who succeeds in securing the white piece vindicates his honor. In Germany, in what is curiously enough called the "American duel," the two parties draw lots, and the unlucky one is bound to die by his own hand in a specified time. The most interesting German dueling custom is the student *Mensuren*. Nearly every student belongs to a *Corps*, as a member of which he is bound to fight. If after a reasonable length of time he has had no quarrel thrust upon him, the leader of the corps informs him that he must have a duel within a certain period. He is then obliged to secure a quarrel with some one—perhaps he may select his best friend. The duels are fought with *Schläger*—long, thin, double-edged weapons which are sharpened only at the extremities. The parts of the body liable to be hit and also the sword arm are protected by padding. The throat is protected by a stiff collar and the eyes by heavy goggles, so that the only exposed parts are the face and brow. Wounds are seldom serious, but often leave ugly scars, of which the bearers are very proud. The custom is senseless enough, but seems to be firmly fixed in student tradition, and has been sanctioned by German leaders, notably by Prince Bismarck. Since 1883 these duels have been punishable with imprisonment, but the law is not enforced with much rigor. Revised by C. H. THURBER.

Duen'na (in Sp. *dueña*): the chief lady-in-waiting on the Queen of Spain; in a more general sense a woman holding a middle station between a governess and a companion, and appointed to take charge of young ladies.

Duer, JOHN, LL. D.: jurist; b. in Albany, N. Y., Oct. 7, 1782; son of Col. Duer. He practiced law in New York city, whither he removed in 1820, and was elected a judge of the superior court of that city in 1849. Among his works is *The Law and Practice of Marine Insurance* (2 vols., 1845–46). He succeeded Oakley as chief justice of the superior court in 1857. D. on Staten Island, Aug. 8, 1858.

Duer, WILLIAM ALEXANDER: jurist; b. in Dutchess co., N. Y., Sept. 8, 1780; a brother of John Duer. His mother was a daughter of Gen. William Alexander, claimant of the earldom of Stirling. He was admitted to the bar in 1802, and became a partner of Edward Livingston in New Orleans, but returned to the city of New York about 1812. He was a judge of the Supreme Court of New York from 1822 to 1829. In the latter year he was chosen president of Columbia College. He was the author of a *Treatise on the Constitutional Jurisprudence of the United States* (1856). D. in New York, May 30, 1858.

Duez, dü'ā', ERNEST ANGE: figure-painter; b. in Paris, France, Mar. 8, 1843. Pupil of Carolus-Duran; first-class medal, Salon, 1879; officer Legion of Honor 1889. His pictures of modern Parisian life are charming. He sometimes painted historical and religious subjects. His triptyeh *St. Cuthbert* is a work of fine quality, and is in the Luxembourg Gallery, Paris. D. in Paris, Apr. 5, 1896. W. A. C.

Dufaure, dü'fōr', JULES ARMAND STANISLAS: orator and statesman; b. at Saujon, in Charente-Inférieure, France, Dec. 4, 1798; practiced law at Bordeaux; was elected to the Chamber of Deputies in 1834, and became an influential leader of the liberal party. After the formation of the republic in 1848 he was a moderate republican member of the Assembly, and was Minister of the Interior for about two months ending in December of that year. He filled the same office from June to Oct., 1849, and was driven from the public service by the *coup d'état* of Dec., 1851, after which he gained great eminence at the bar. He was appointed Minister of Justice by Thiers in Feb., 1871. D. at Rueil, June 27, 1881.

Dufay, dü'fā', CHARLES FRANÇOIS DE CISTERNAY: savant; b. in Paris, France, Sept. 14, 1698. He was the author of the theory of two kinds of electricity, vitreous and resinous, and wrote treatises on chemistry and other sciences. D. July 16, 1739.

Duff, ALEXANDER, D. D., LL. D.: Presbyterian missionary; b. on a farm near Pitlochry, Perthshire, Scotland, Apr. 26, 1806; educated at St. Andrews. In 1829 he was ordained the first missionary of the Kirk to India, and labored there with great zeal and success for many years. He departed from the traditional methods of missionary work, and laid emphasis upon the value of education in secular matters alongside of the religious. In 1839 he published a work *On India and the Missions*. After the disruption of the Scottish Church in 1843 he was the chief agent of the mission which the Free Church maintains at Calcutta. He visited the U. S. in 1854, returned to India in 1855, and remained there until 1863. After his return to Scotland he became Professor of Evangelistic Theology in the theological schools of the Free Church. D. in Edinburgh, Feb. 12, 1878. See his *Life* by George Smith (2 vols., London, 1879; 2d ed. 1881).

Dufferin and Ava, FREDERICK TEMPLE HAMILTON BLACKWOOD, Marquis of: British diplomatist; b. in Florence, Italy, June 24, 1826, and educated at Eton and at Christ Church, Oxford. He succeeded to his father's title July 21, 1841; for a few years subsequent was lord-in-waiting to the Queen; in 1855 was attached to the mission of Lord John Russell to Vienna; in 1860 sent as British commissioner to Syria to investigate the massacre of Christians there; was Under Secretary of State for India 1864–66, and in the latter year for a short time Under Secretary for War. In 1868 he was appointed Chancellor of the Duchy of Lancaster; created a British earl in 1871, and in 1872 appointed Gov-

ernor-General of Canada, an office which he held for six years. He secured a great degree of popularity during his term of office in Canada owing to his courtesy, and to his ability and tact in his eloquent addresses. In Feb., 1879, he was appointed British ambassador at St. Petersburg; transferred to Constantinople in May, 1881; in Oct., 1882, proceeded to Cairo to settle a difficulty between the British Government and Egypt: in 1884 was appointed Viceroy of India; in 1888 British ambassador at Rome; the same year was created Marquis of Dufferin and Ava; and was British ambassador at Paris, 1891–96, when he retired from the diplomatic service. In 1878 he was elected president of the Royal Geographical Society; received the degree of LL. D. from Harvard same year, and that of D. C. L. from Oxford in 1879. Among his published works are *Letters from High Latitudes* (London, 1860); *Contributions to an Inquiry into the State of Ireland* (1866); *Speeches in India* (1890).—His wife, Georgina Rowan Hamilton, to whom he was married in 1862, is author of *Our Viceregal Life in India* (1889) and *My Canadian Journal* (1891). *Lispings from Low Latitudes* (1863), erroneously attributed to his wife, was the production of his mother. Neil Macdonald.

Duffield, George, D. D.: clergyman; b. in Lancaster co., Pa., Oct. 7, 1732; son of George Duffield, who emigrated from Ireland to Pennsylvania about 1732, and became an extensive landholder. The son graduated at Princeton College in 1752, and was tutor for two years in that institution; ordained to the Presbyterian ministry in 1761; after ministering to churches at Carlisle, Big Springs, and Monaghan, labored as a missionary in Maryland and Virginia as well as in his native State; opposed the Old Light party in the Presbyterian Church (see Old Lights); in 1771 was settled over the Third Presbyterian church of Philadelphia; noted for patriotism; became chaplain in the Revolutionary army, and was associate chaplain of the first Continental Congress (1774); was active in reorganizing the Presbyterian Church after the war; author of *An Account of a Missionary Tour through Western Pennsylvania in 1766*, and *A Thanksgiving Sermon on Peace*, delivered in 1783. D. in Philadelphia, Feb. 2, 1790.

Duffield, George, D. D.: clergyman; grandson of George Duffield (1732–90); b. at Strasburg, Lancaster co., Pa., July 4, 1794; educated at the University of Pennsylvania. He was for many years a pastor of Presbyterian churches in Philadelphia, New York, and Detroit, and was an active leader of the "New School" movement. D. in Detroit, Mich., June 26, 1869.

Duffield, George, D. D.: clergyman; son of George Duffield (1794–1869); b. at Carlisle, Pa., Sept. 12, 1818; graduated at Yale College 1837, and at Union Theological Seminary, New York city, 1840; held various Presbyterian pastorates. Author of the familiar hymns *Blest Saviour, Thee I love* (1851) and *Stand up, stand up, for Jesus* (1858). D. at Bloomfield, N. J., July 6, 1888.

Duffield, John Thomas, D. D., LL. D.: mathematician; b. in McConnellsburg, Pa., Feb. 19, 1823; graduated at Princeton College 1841, and at the Theological Seminary there 1844. In the college he became successively tutor in Greek 1845, Adjunct Professor of Mathematics 1847, Professor of Mathematics 1856, Professor of Mathematics and Mechanics 1862, and Professor of Mathematics again 1871. He published *The Princeton Pulpit* (1850) and various important articles and pamphlets, among them *The Discovery of the Law of Gravitation*; *That Blessed Hope* (1866); *The Philosophy of Mathematics* (1867); *Is the Origin of Man by Evolution consistent with Biblical Anthropology?* (1878); *Discourse at the Funeral of President McLean* (1886). D. in Princeton, Apr. 10, 1901. Willis J. Beecher.

Duffield, Samuel Augustus Willoughby: Presbyterian clergyman and religious poet; son of George Duffield (1818–88); b. in Brooklyn, N. Y., Sept. 24, 1843; graduated at Yale 1863; from 1882 preached at Bloomfield, N. J. Among his publications are *Warp and Woof* (New York, 1870); *English Hymns, their Authors and History* (1886); and *Latin Hymn-writers and their Hymns* (posthumous, completed and edited by Robert Ellis Thompson, 1889). D. at Bloomfield, N. J., May 12, 1887. H. A. Beers.

Duffy, Sir Charles Gavan: statesman and author; b. in Monaghan, Ireland, 1816; edited a journal in Dublin and then in Belfast; was one of the founders of the *Nation*, which became the organ of the Young Ireland party, and at first zealously supported O'Connell; was tried and convicted of sedition along with O'Connell, but the House of Lords quashed the conviction on appeal. He was again tried with the leaders of the Young Ireland party in 1848 for treason-felony, but was acquitted. He was elected to Parliament from New Ross 1852, but resigned 1856 and emigrated to Australia, where he filled important offices in Victoria, becoming Prime Minister of the colony 1871. He is author of *The Ballad Poetry of Ireland*; *Young Ireland: a Fragment of Irish History, 1840–50* (1880); and *Four Years of Irish History, 1845–49* (1883). F. M. Colby.

Dufile: See the Appendix.

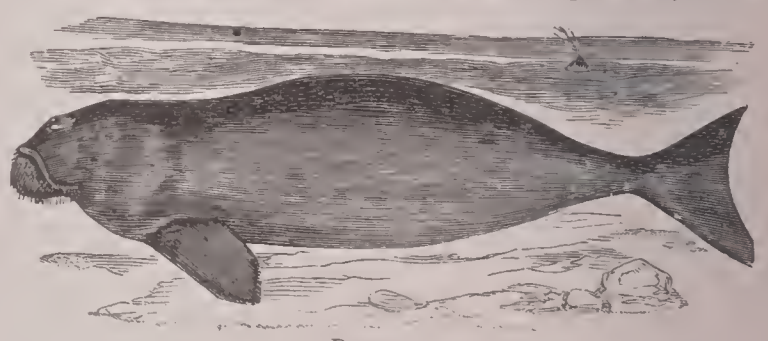
Dufour, dü'foor', Guillaume Henri: general; b. at Constance, Baden, Sept. 15, 1787; entered the French army in 1809, and rose to the rank of captain in the Hundred Days, but retired from the French service after the battle of Waterloo and resumed his Swiss citizenship. In 1847 he was chosen commander-in-chief of the federal army raised to defend the integrity of the republic against the Roman Catholic Sonderbund. He quickly quelled the rebellion. In 1864 he was president of the Geneva convention. Among his works are *De la fortification permanente* (On Permanent Fortification, Geneva and Paris, 1824) and *Cours de Tactique* (Manual of Tactics, 1840). D. in Geneva, July 14, 1875.

Duganne, dü'găn', Augustine Joseph Hickey: poet and novelist; b. in Boston, Mass., in 1823; published *The Ring of Destiny*, several volumes of poems, and a *Class-book of Governments and Civil Society* (1859). Among his poems are *The Iron Harp* (1847). He commanded a regiment in the civil war. D. in New York, Oct. 20, 1884.

Dugdale, Sir William: antiquary; b. near Coleshill, Warwickshire, England, Sept. 12, 1605; appointed blanch-lion pursuivant-extraordinary in 1638; rouge-croix pursuivant-in-ordinary in 1640; became Chester herald in 1644; was a royalist in the civil war; became Norroy king of arms in 1660, after the restoration of Charles II., and Garter king of arms in 1677. Dugdale and Dodsworth published an important work on English monasteries entitled *Monasticon Anglicanum* (3 vols., 1655–73). Among his other works are *Antiquities of Warwickshire* (1656), which is highly esteemed, and *Origines Juridiciales* (1666). D. Feb. 10, 1686. See *Life and Diary of Sir W. Dugdale* (edited by Hamper, 1827).

Dughet, dü'gā', Gaspard (known in France by the name of Gaspard Poussin): landscape-painter; b. in Rome, 1613. He studied with his brother-in-law, Nicholas Poussin, up to the age of eighteen. He then worked under Claude Lorrain. After this, his reputation being made, he worked for the Princes Borghese and Panfili, and the Constable Colonna and even Bernini employed him to decorate rooms. He was a popular landscape-painter; his works are to be found in almost every gallery in Italy. Many of his pictures have been engraved in England. D. in Rome, 1675. W. J. S.

Du'gong [a word of Malay origin]: a marine animal of the genus *Halicore*, belonging to the *Sirenia*. The dugong of the Australian seas (*Halicore australis*) is generally about



Dugong.

8 feet long. The upper lip is thick and fleshy, and forms a kind of snout; the upper jaw bends downward almost at a right angle; the eyes are very small, with a nictitating membrane; the skin thick and smooth. In its internal structure it has considerable resemblance to the pachyderms, and it feeds chiefly on algæ. It is also remarkable for the ventricles of the heart being entirely detached from each other. Its flesh is said to resemble beef, and is prized as food. The oil is recommended as a substitute for cod-liver oil, and there is a regular fishery for the dugong in Moreton Bay. The species inhabiting the Indian Ocean is *Halicore dugong*, that found in the Red Sea has been called *Halicore tabernaculi*, from a belief that the skin of the animal was used by the Jews to cover the tabernacle.

Revised by F. A. Lucas.

Duguay-Trouin, dü′gü-ā′troo′ăn′, René: French naval officer and soldier; b. at St.-Malo, June 10, 1673. From 1690–97 he commanded a privateer, and in the latter year he entered the royal navy as captain, serving with distinction in the war of the Spanish succession. In 1707 he captured three English warships with a convoy of about sixty merchant-vessels and transports. When it was known in France that Charles Duclerc had failed in his attack on Rio de Janeiro, and that he had been imprisoned and assassinated, Duguay-Trouin resolved to repair this disgrace to the French arms. Encouraged by the Government, he got together at St.-Malo 16 vessels and 4,500 men, and with this squadron he appeared at Rio de Janeiro Sept. 12, 1711. The governor, Francisco de Castro Moraes, though he had superior forces, made no resistance, and finally fled from the city. The French took possession Sept. 22, sacked the public and private buildings, and, after exacting a ransom from the cowardly governor, sailed away in triumph. Duguay-Trouin subsequently served with the French army, attaining the rank of lieutenant-general. D. Sept. 27, 1736.

Herbert H. Smith.

Du Guesclin, dü′gā′klăn′, Bertrand: general; b. near Rennes, France, about 1314; fought against the English, who occupied many places in France, and defeated the Duke of Lancaster at Rennes in 1356. In 1366 he commanded an army which fought for Henri de Trastamare against Peter the Cruel of Castile. He gained a victory over Peter, but he was defeated and taken prisoner by the English Black Prince in 1367. He paid a large ransom, and was soon released. Having been appointed Constable of France in 1369, he defended the country against the English invaders, whom he expelled from nearly every province of France before 1375. D. July 13, 1380. See Froissart, *Chronicles*; Jamison, *Life of Duguesclin* (1864).

Duhamel, dü′ăă′mel′, Joseph Thomas: Roman Catholic archbishop; b. at Contrecœur, Province of Quebec, Canada, Nov. 6, 1841, and educated at the College of Ottawa. He was ordained priest in 1863, went to Rome in 1869, and in 1874 was consecrated Bishop of Ottawa. He founded several Christian Brothers' schools there; revisited Rome in 1878, 1882, and in 1886 was appointed first Archbishop of Ottawa. In 1882 he was made a Count of the Holy Roman Empire.

Neil Macdonald.

Duhamel du Monceau, -dü-mōn′sō′, Henri Louis: botanist; b. in Paris, France, in 1700. Among his numerous useful works are a treatise on the culture of land (1751); a treatise on the structure and physiology of plants, entitled *De la Physique des Arbres* (1758); and a work on the elements of agriculture (1762). He was a member of the Academy of Sciences. D. Aug. 23, 1782.

Duhring, Louis A., M. D.: dermatologist; b. in Philadelphia, Pa., Dec. 23, 1845; educated at the University of Pennsylvania, where he afterward became Professor of Dermatology; ex-president American Dermatological Association; member of the British, French, and New York Dermatological Societies. Author of *Treatise on Skin Diseases* (1st ed. 1887, subsequently 2d and 3d eds., translated into French, Italian, and Russian); *Atlas of Skin Diseases* (1876–80); *Epitome of Skin Diseases* (1882).

Duillian Column: the *Columna Rostrata* which was erected in the forum at Rome (as Quintilian states) to commemorate the victory of the consul Caius Duillius in the battle of Mylæ, off the northern coast of Sicily, 260 B. C.—the first naval victory of the Romans over the Carthaginians. Columns of this kind were called *rostratæ*, from having the beaks of ships (*rostra*) projecting on each side. The restoration of the Duillian column by Michaelangelo is now preserved in the Palazzo de' Conservatori on the Capitoline Hill, retaining on the pedestal a portion of the original inscription in archaic Latin. The inscription has been copied and printed, and may be found at the end of the fourth book of Duker's *Florus*.

Henry Drisler.

Duisburg, doo′is-boorkh: a town of Rhenish Prussia; on the Ruhr and near the Rhine; 16 miles N. of Düsseldorf (see map of German Empire, ref. 4–C). It is an old town, and has a church founded in 1187. Here is a gymnasium, with a Realschule and a high school for girls; also manufactures of cotton and woolen fabrics, hosiery, porcelain, soap, etc. In the thirteenth century it was a city of the Hanseatic League. The railway which connects Cologne with Minden passes through this place, which has been declared a free port. Pop. (1895) 70,272.

Dujardin, dü′zhăăr′dăn′, or **De Jardyn**, Karel: painter; b. in Amsterdam, Holland, about 1640; was a pupil of Berghem. He studied in Rome and painted pastoral landscapes. He made also a series of fifty etchings of rural subjects, which are much sought. During a second visit to Italy he died at Venice, Nov. 20, 1678.

Duke [O. Fr. *duc* = Ital. *duca*, from Byz. Gr. δούκα, loan from accus. form of Lat. *dux*, leader; the regular successor of *dux* may be found in Ven. *doge*]: a title originally given in the Byzantine empire to military governors of provinces, and previous to the time of Theodosius regarded as inferior to that of count. Dukes in Germany became in course of time the chief princes of the empire. In France and Italy dukes form the second rank in the nobility, being next below princes; in England they are first. The title was introduced in the reign of Edward III., whose eldest son, the Black Prince, was made Duke of Cornwall. In 1351 Henry Plantagenet, Earl of Lancaster, became Duke of Lancaster. The dignity thus created in these instances was not a dukedom by tenure; it has always remained a personal title only, hereditary according to the limitations of the patent. The Austrian archdukes and the Russian grand dukes are princes of the blood. The princes of the royal house of Saxony also have the title of duke. In Bavaria and Würtemberg the side branches of the reigning family are called "dukes in Bavaria" and "Dukes of Würtemberg." In Prussia the title was conferred in 1840 upon the Prince Hohenlohe Waldenburg Schillingsfürst (Duke of Ratibor), and in 1861 upon Prince Hohenlohe Ochringen (Duke of Ujest). Several reigning sovereigns of German states have the title of duke (Anhalt, Brunswick, Saxe-Coburg, Saxe-Meiningen, Saxe-Altenburg) or of grand duke (Baden, Hesse, Oldenburg, Saxe-Weimar, Mecklenburg-Schwerin, and Mecklenburg-Strelitz). Royal dukes in Great Britain are princes of the blood. British dukes have no territorial jurisdiction. The English dukes are, next to the peers of the royal blood and the Archbishops of Canterbury and York, the first peers of the realm.

Dulce y Garay, dool′thā-ee-gaă-raa′ĕe, Domingo: Marquis of Castell-Florit; Spanish general; b. at Sotés, Logroño, May 7, 1808. He entered the College of Cadets, 1823; took part in the Carlist war; was captain-general of Catalonia in 1854, and in July of that year aided in the triumph of the revolution. From Dec. 10, 1862, to May 30, 1866, he was captain-general of Cuba, distinguishing himself by the strong measures which he took for the suppression of the slave-trade; in two years he recovered 3,565 Africans who had been illegally imported. On his return to Spain he proposed a plan for the gradual abolition of slavery in Cuba. He conspired with Prim, Torre, and others for the dethronement of Isabel II., but took no active part in the revolution. In June, 1869, he again became captain-general of Cuba, but the success of the insurgents forced him to resign. Owing to sickness he retired to Amélie-les-Bains in France, where he died in Dec., 1869.

Herbert H. Smith.

Dulcigno, dool-cheen′yō (anc. *Olcinium*; Turk. *Olgoon*): town and seaport, formerly of European Turkey; lat. 41° 54′ N., lon. 19° 12′ E.; on the Adriatic Sea; 14 miles W. S. W. of Scutari (see map of Turkey, ref. 3–B). It is the seat of a Catholic bishop, and has a trade in timber and oil. It was ceded to Montenegro in 1880. Pop. 5,000.

Dulles, Charles Winslow: surgeon and author; b. at Madras, India, Nov. 29, 1850; educated at Lawrenceville, N. J., and University of Pennsylvania (M. D. 1875). He has been surgeon in several hospitals, is fellow of the College of Physicians and of the Academy of Surgery of Philadelphia, and is a frequent contributor to medical literature. He has published *What to do First in Accidents or Poisoning* (Philadelphia, 1880); *What to do First in Accidents and Emergencies* (2d ed. 1883); *Accidents and Emergencies* (3d ed. 1888).

Dulong, dü′lōn′, Pierre Louis: chemist; b. at Rouen, France, Feb. 12, 1785; studied and practiced medicine, but the brilliant discoveries of French chemists soon drew him to the study of chemistry. He studied with Berthollet, and discovered the chloride of nitrogen in 1812. With the Swedish chemist Berzelius he made a new analysis of water, revealing the inexactness of the former analysis, and investigated the formation of carbonic acid gas; but his chief distinction lies in his share in the discovery of the law that the capacity for heat of elementary atoms is identical, known in chemistry as Dulong and Petit's law. He was chosen a

member of the Academy of Sciences in 1823. D. in Paris, July 19, 1838.

Dulong and Petit's Law: See CHEMISTRY.

Dulse: the name popularly given to many of the red seaweeds. The *Rhodymenia palmata*, belonging to the *Rhodymeniaceæ*, grows on rocks on the coasts of the British islands, the U. S., and other regions. It has a sessile leaf-like body (the so-called frond) of a dark-red or purple color, irregularly notched, and of a leathery texture. It is an important article of food in Iceland, where it is dried and stored in casks. It is abundant on all the coasts of Great Britain, and is sometimes used as food, either raw or cooked. The *Schyzimenia edulis*, of the family *Cryptonemiaceæ*, is also called dulse, and is used as food. This also occurs in the U. S. "Pepper dulse," of the genus *Laurentia*, is eaten in Scotland. It grows on the Pacific coast of North America. Revised by CHARLES E. BESSEY.

Duluth': city and railway center; capital of St. Louis co., Minn. (for location of county, see map of Minnesota, ref. 4–F): situated at the west extremity of Lake Superior; 155 miles N. N. E. of St. Paul. It is one of the eastern termini of the Northern Pacific R. R., the northern terminus of the St. Paul and Duluth R. R., and the terminus of seven other railways. It has a custom-house, a weather-signal office, and some of the largest private docks in the U. S. Among the noteworthy public buildings are the opera-house, the board of trade building, the State normal school, the public library, masonic hall, and the central high school, one of the finest public-school buildings in the U. S., costing over $500,000. The harbor, entered by a ship-canal 250 feet wide, is landlocked, being formed by Minnesota and Rice's Points; the former is a scythe-shaped natural breakwater, running out 7 miles into the lake. The harbor has been improved by the construction of several docks and piers, independent of the railway company's works. Large quantities of wheat, flour, sheep, wool, hides, iron, copper and silver ore and bullion are shipped from here, and the capacity of the elevators of the city aggregates 35,000,000 bushels. Duluth has a blast furnace, machine and car-building works, lumber-mills, and other manufactories. There are quarries of granite, sandstone, slate, and trap in the vicinity. The fisheries of Duluth are very important. A superior water supply for the city, from the fresh clear waters of Lake Superior, has been installed at an expense of over $2,000,000. In May, 1869, the site of the city was a forest—the old Duluth was on Minnesota Point. It was named after Grecylon Du Luth, an early French explorer of this region. The village of West Duluth was annexed Jan. 1, 1894. Pop. of Duluth (1880) 838; (1890) 33,115; (1900) 52,969. SECRETARY IMPROVEMENT ASSOCIATION.

Dul'wich: a suburb of London, England; in Surrey, 5 miles S. of London (see map of England, ref. 12–J). It is pleasantly situated near Sydenham, and has numerous handsome villas and mansions. Here is Dulwich College, founded in 1619 by Edward Alleyne, a tragic actor.

Dumas, dü'maa', ALEXANDRE: poet, novelist, and dramatist; member of the French Academy; b. in Paris, July 28, 1824; son of Alexandre Davy Dumas. Began his literary career, while a boy of seventeen, with a book of trivial poems, *Péchés de Jeunesse* (1847); traveled through Spain and Northern Africa with his father, and on his return published *Aventures de quatre femmes et d'un perroquet* (1847). This was followed by *La Dame aux camélias* (1848); *Le Roman d'une femme* (1848); *Diane de Lys* (1851); *La Dame aux perles* (1854); *La Vie à Vingt ans* (1856), and others in rapid succession. Their style was simple, natural, and dramatic, and their popularity immediate and permanent. *La Dame aux camélias* put into dramatic form (1852) brought increased fame and fortune, and was followed by *Diane de Lys* (1853), *La Dame aux perles* (1855), and *Demi-Monde* (1855). In 1868 he published a complete edition of his plays, and in the prefaces advanced bold and radical social theories which were widely discussed. His most famous plays are *Le Demi-Monde* (1855); *Le Fils naturel* (1856); *Les Idées de Mme. Aubray* (1867); *Une Visite de Noces* (1871); *Monsieur Alphonse* (1877); *l'Étrangère* (1876); *Denise* (1885). He was joint author with Émile de Girardin of *Supplice d'une femme* (1865) and *Heloïse Paranquet* (1866). D. in his palace at Marly-le-Roi, Nov. 27, 1895.

Dumas, ALEXANDRE DAVY: novelist and dramatist; b. at Villers-Cotterets, Aisne, France, July 24, 1803. He was not liberally educated. He went to Paris in 1823 to seek his fortune. In 1828 he produced *Henri III.*, a drama which was very successful. He was a writer of the romantic school, and was remarkable for literary fecundity. Even those novels which seem loosest and least substantial are distinguished by an abundance of fancy and a luxuriance of imagination which make a certain impression. He displayed much skill in the construction of plots. He understood the art of creating excitement in the minds of his readers, but this quality, to which his success is chiefly due, is also the principal argument against his books. Among his novels are *Les trois mousquetaires*, with continuations (30 vols., 1844–45), and *Le Comte de Monte Cristo* (12 vols., 1845). It appears that a large part of the works published in his name were written by other men. A scandalous lawsuit divulged that he bought other people's manuscript and ably retouched it. His dramas have, indeed, a much greater literary value than his novels. *Le Mariage sous Louis XV.* is still played with effect on all European stages. D. at Puys, near Dieppe, Dec. 5, 1870.

Dumas, JEAN BAPTISTE: chemist; b. in Alais, France, July 14, 1800. He began the study of pharmacy in Geneva, and afterward, following the advice of Alexander von Humboldt, went to Paris. He became Professor of Chemistry in the École centrale des Arts et Manufactures, and at the Sorbonne. His lectures were extremely attractive. From 1849 to 1852 he was Minister of Agriculture and Commerce. He exerted a powerful influence on the development of chemistry. He studied the substituting action of chlorine on organic compounds and developed his theory of substitution (1834). He further devoted much attention to the study of the relations between the specific gravity of gases and atomic weights. From 1840 he was one of the editors of the *Annales de Chimie et de Physique*. D. at Cannes, Apr. 11, 1884. IRA REMSEN.

Dumas, MATHIEU, Count: general; b. at Montpellier, France, Nov. 23, 1753. He fought for the U. S. in 1780–82 as aide-de-camp to the Comte du Rochambeau, and was a moderate member of the Legislative Assembly in 1791, and in the following year was elected president of that body. In the Reign of Terror he was condemned to death, but escaped and went into exile. He became a general of division in 1805, served at Ulm and Austerlitz, and after the campaign was called to Naples by the new king, Joseph Bonaparte, who made him his Minister of War. In 1812 he was intendant-general of the grand army in Russia. He wrote a narrative of the French campaigns from 1798 to 1807, entitled *Précis des Événements Militaires* (19 vols., 1816–26), and *Souvenirs*, an account of his career. D. in Paris, Oct. 16, 1837.

Du Maurier, GEORGE LOUIS PALMELLA BUSSON: a British artist, humorist, and novelist of French descent; b. in Paris, Mar. 6, 1834; lived in France until he was seventeen; studied art in Gleyre's studio, Paris, and had intended to be a painter until he had a severe affection of the eyes. After his recovery he devoted himself mainly to black-and-white work, and especially to book illustration. In 1862 he was working for *Once a Week*, but had been a contributor to *Punch* as early as June, 1860, his connection with which continued until his death, Oct. 8, 1896. He also illustrated Thackeray's *Henry Esmond*, though not in its original form; Douglas Jerrold's *Story of a Feather*, and other books. His fame, however, now rests on his novels, *Peter Ibbetson* (1891), *Trilby* (1894), and *The Martian* (which appeared as a serial in *Harper's Magazine* shortly after his death), but specially on *Trilby*.

Dumb: See DEAF-MUTES.

Dumb Ague: See INTERMITTENT FEVER.

Dumbar'ton: a county of Scotland; area, 264 sq. miles. It consists of two detached parts, one bounded E. by Loch Lomond, S. by the estuary of the Clyde, and W. by Loch Long; the other, much smaller, lying on both sides of the Forth and Clyde Canal. The surface is mountainous, and presents much picturesque scenery. Here are mines of coal and iron, and quarries of limestone and slate. Capital, Dumbarton. Pop. (1891) 94,511; (1901) 113,660.

Dumbarton, or **Dunbarton**: a seaport of Scotland; capital of the county of same name; on the river Leven near its entrance into the Clyde; 13 miles N. W. of Glasgow (see map of Scotland, ref. 11–F). Steamboats ply regularly between this port and Glasgow, with which it is also connected by rail. It has manufactures of glass, machinery, and ropes, and ship-building is extensively car-

ried on. Here, on a steep, rugged, basaltic rock, rising to the height of 560 feet, stands the famous Dumbarton Castle, which has been a stronghold for many centuries. Pop. (1881) 10,294; (1891) 14,172.

Dumb-cane: a West Indian shrub (*Dieffenbachia seguine*), so named from its acrid juice causing the tongue to swell. It belongs to the family *Araceæ*. The root and the juice have medicinal properties, and are used in sugar-refining.

Dumbness: in medicine, the loss of the power of speech, from whatever cause arising. When associated with deafness, it is usually the result of that deafness; the child being unable to hear, of course is unable to learn to talk; but there are at least two important varieties of dumbness which are the direct results of disease, namely APHASIA (*q. v.*), due to brain disease, and APHONIA (*q. v.*), due to external disease, as of the larynx or vocal cords. See also DEAF-MUTES.

Dum'dum: a town of British India, in Bengal; 8 miles N. E. of Calcutta (see map of S. India, ref. 1–I). Here are a cantonment and a cannon-foundry. It was here that in 1757 the ruler of Bengal made treaties with the British which have permitted the progress of the latter in Eastern India; and in 1857 it was the scene of the first open resistance of the Sepoys to the use of greased cartridges. Pop. 4,500.

Dumfries, or **Dumfriesshire**: a county in the south of Scotland; bounded S. by Solway Firth, E. by Cumberland, N. by Roxburgh, Selkirk, Peebles, and Lanark, and W. by Ayr and Kirkcudbright. Area, 1,071 sq. miles. It is drained by the Annan, the Esk, and the Nith rivers. The surface is mountainous in the N. and undulating in the S. The valleys of the Annan, Esk, and Nith are fertile. The climate is, generally speaking, mild, with a mean temperature of 50° and a sufficient average rainfall. The soils are gravel, sandy loam, clay, or along the rivers and their estuaries, rich alluvial deposits. The county is consequently essentially an agricultural one, and as such it takes a high rank. Large crops of oats, wheat, turnips, etc., are raised; the cattle, and especially the sheep, have a high reputation. Among the minerals of this county are coal, lead, silver, limestone, and new red sandstone. It is traversed by two railways extending to Edinburgh and Glasgow. The chief towns are Dumfries, Annan, Moffat, and Sanquhar. Pop. (1881) 76,140; (1891) 74,308; (1901) 72,562.

Dumfries: a seaport of Scotland; capital of the county of same name; on the river Nith; 9 miles from its entrance into Solway Firth, and 64 miles S. by W. from Edinburgh (see map of Scotland, ref. 14–H). It is well built of red freestone, and is regarded as the capital of the south of Scotland. Two bridges across the river connect it with Maxwelltown. The high tides of Solway Firth bring vessels of 60 tons to the town, and larger vessels to the river quays near Dumfries. Here are manufactures of woolen cloths (tweeds), hosiery, hats, etc. An infirmary and an asylum for lunatics are among the public institutions. Among the notable objects of the place are the tomb of Burns, who here officiated as exciseman, and a statue of the poet. Pop. (1891) 17,804.

Dümichen, dü'mich-*en*, JOHANNES: Egyptologist; b. at Weizholz, near Grossglogau, Silesia, Oct. 15, 1833; studied in Berlin, and passed many years in archæological research in the valley of the Nile. He has written several treatises on Egyptian inscriptions.

Dumont, dü'mōn', PIERRE ÉTIENNE LOUIS: author; b. in Geneva, Switzerland, July 18, 1759. He was a Protestant minister, and emigrated in 1782 to St. Petersburg, where he preached for eighteen months. In 1785 he removed to England, and became tutor to the sons of Lord Shelburne. He was intimate with Sir Samuel Romilly and Jeremy Bentham. He passed the years 1790 and 1791 mostly in Paris, where he associated with Mirabeau, whom he aided in composing his speeches and reports. Having returned to England in 1792, he edited and popularized Bentham's works on legislation—namely, *Traités de Législation* (1802) and *Théories des Peines et Récompenses* (1810). D. at Milan, Sept. 29, 1829, leaving *Souvenirs sur Mirabeau* (1832). See A. P. de Candolle, *Notice sur la Vie et les Écrits de M. Dumont* (1829).

Dumont d'Urville, -dür'vēl', JULES SÉBASTIEN CÉSAR: navigator; b. at Condé-sur-Noireau, France, May 23, 1790. He commanded an expedition sent in 1826 to obtain tidings of La Pérouse and to survey the coasts of New Zealand, New Guinea, etc. In 1837 he conducted an exploring expedition to the Antarctic regions. He discovered land, which he called Terre Adélie, in lat. 66° 30′ S.; returned in 1840, and became a rear-admiral. He wrote *Enumeratio plantarum in insulis archipelagi et litoribus Ponti Euxini* (Paris, 1822); *Voyage de l'Astrolabe* (1830–34); *Voyage Pittoresque autour du Monde* (1834; new ed. 1859); and *Voyage au pôle sud et dans l'Océanie* (1841–54). D. at Versailles, May 8, 1842.

Dumoulin, dü'moo'lăn' (in Lat. *Molinæus*), CHARLES: jurist; b. in Paris in 1500. Though a Protestant and often persecuted for his religion, he was not prevented from freely expressing his views. He wrote several legal works which are esteemed among the greatest treatises on French law ever published. The most famous of these are his *Commentaires sur le titre des Fiefs de la Coutume de Paris* and *De Dividuo et Individuo*. In 1564 he published a vigorous work on the Council of Trent, examining its decrees in detail, and protesting against accepting them as the laws of the state. His books were placed on the Index Expurgatorius, but the Italians published them under the fictitious name of Gasper Caballinus, to evade the restriction against citing him in Italy. D. in 1566.

Dumouriez, dü'moo'ri-ā', CHARLES FRANÇOIS: general; b. at Cambrai, France, Jan. 25, 1739. He served as an officer in the Seven Years' war, was quartermaster-general in Corsica in 1768, and was employed in a secret mission to Poland by the Duke of Choiseul in 1770. Between 1776 and 1787 he was commandant at Cherbourg, where he planned and directed great naval works. In the Revolution he acted with the Girondists. He was appointed Minister of Foreign Affairs in Mar., 1792, and acquired the confidence of the king. War having broken out between France and Austria, he resigned office in June, 1792, in order to take command of the army; the allies, who were advancing in great force, were held in check by him in Maine, and the Prussians were routed in the battle of Valmy, the first battle in which the republican arms were successful. He invaded Flanders in Oct., 1792, and defeated the Austrians at Jemappes in November, and conquered Belgium. According to Lamartine, he was at this period the virtual dictator of all parties. After his defeat by the Austrians at Neerwinde, he was suspected of plotting a counter-revolution and negotiating secretly with the Austrians. The Convention sent four commissioners in Apr., 1793, to summon him to Paris. Dumouriez refused to obey the Convention, and when the commissioners ordered the soldiers to arrest him he sent them as prisoners to the Austrian camp. His army refused to support him in this defection, and he became a fugitive and exile. D. near London, Mar. 14, 1823. See *Mémoires de Dumouriez*, by himself (2 vols., 1794).

Dumpy Level: a leveling instrument with a short telescope of large aperture and a non-reversable bubble. It is used principally in Great Britain, while in the U. S. engineers prefer the wye level. See LEVELING.

Dun [Celtic, cf. Ir. *dūn*, Gael. *dūn*, hill, castle, appearing as *-dūnum* in Lat. names of Celtic towns, as *Lugdu'num*; cogn. with O. Eng. *tūn* > Eng. *town*: Germ. *Zaun*]: a word used as a prefix or suffix in many place-names in Great Britain. It assumes the various forms of *Dun-*, *Dum-*, *Don-*, *-don*, as Dunkirk, Dumbarton, Donegal, etc.

Dü'naburg: a strongly fortified town of Russia; government of Vitebsk; on the river Düna, where it is crossed by the railway from Warsaw to St. Petersburg; about 120 miles S. E. of Riga (see map of Russia, ref. 6–C), with which it is connected by another railway. It is an important military position, and has an active trade. Pop. (1897) 72,231.

Duna Földvar, doo'nă-föld-vaar': town of Hungary; county of Tolna; on the Danube; 28 miles N. of Tolna (see map of Austria-Hungary, ref. 7–G). Here are a Franciscan cloister, important sturgeon-fisheries, and two match-factories. Pop. (1890) 12,250.

Dunbar': a royal burgh and seaport of Haddingtonshire, Scotland; at the mouth of the Firth of Forth; 27 miles E. N. E. of Edinburgh; lat. 56° N., lon. 2° 29′ W. (see map of Scotland, ref. 11–J). It has valuable herring-fisheries, and a harbor which will admit vessels of 300 tons. Dunbar is a fine old town, containing the remains of Dunbar Castle. Cromwell gained near this town a decisive victory over the royalists on Sept. 3, 1650. Pop. (1891) 3,545.

Dunbar, PAUL LAURENCE: See APPENDIX.

Dunbar, WILLIAM: poet; b. at Salton, in Lothian, Scotland, about 1460. He was a Franciscan friar and itinerant

preacher in his youth. He was employed by James IV. as clerk of embassy. Among his works are *The Thistle and the Rose* (1503), an allegory in honor of the marriage of James VI., and *The Merle and Nightingale*, poems showing a rich fancy. He also wrote several poems of a religious character, and some powerful satires, among them *The Dance of the Seven Deadly Sins*. By many he is considered to be the greatest of the Scottish poets. An edition of his works, by Dr. John Small, was published in 1884. D. about 1520.

Dunbarton, Scotland: See DUMBARTON.

Duncan, ADAM, Viscount Duncan of Camperdown: admiral; b. in Dundee, Scotland, July 1, 1731; entered the navy in 1746, and became a post-captain in 1761. In 1789 he obtained the rank of rear-admiral of the blue. With the rank of vice-admiral he was appointed commander of a fleet in the North Sea in 1795, and waged war against the Dutch. He defeated the Dutch and captured eleven of their vessels near Camperdown in Oct., 1797, and was raised to the peerage for that service. D. in Dundee, Aug. 4, 1804.

Duncan, JOHN: Hebraist; b. at Gilcomston, near Aberdeen, Scotland, 1796. He graduated from Marischal College, Aberdeen, in 1814, studied theology in Edinburgh, and was licensed to preach in 1825. Having been converted in 1826 under the influence of Cæsar Malan, he settled in 1831 at Glasgow, but went in 1841 to Pesth as missionary among the Jews, and was in 1843 appointed Professor of Hebrew and Oriental Languages in Edinburgh. His conversation was extraordinary, his spiritual influence great, but his capacity to impart didactic instruction very small. See David Brown, *Life of John Duncan* (Edinburgh, 1872) and *John Duncan in the Pulpit and at the Communion Table* (1874); also William Knight, *Colloquia Peripatetica* (1870; 5th ed. 1879). D. in Edinburgh, Feb. 26, 1870.

Duncan, JOHNSON KELLY: general; b. in York, Pa., Mar. 19, 1827; graduated at West Point in 1849. He entered the service of the Confederate States in 1861, and took command of Forts Jackson and St. Philip, on the Mississippi below New Orleans. After the fleet of Farragut had passed these forts Duncan surrendered them, Apr. 29, 1862. D. in Knoxville, Ky., Dec. 18, 1862.

Duncan, SARA JEANETTE: author; b. in Brantford, Ontario, Canada, in 1863, and educated there. She contributed extensively to Toronto and Montreal newspapers and periodicals, and, in her capacity as newspaper correspondent, made a tour of the world. In 1890 she was married to Mr. Everard Cotes, of Calcutta, India, where she now resides. She wrote *A Social Departure* (New York and London, 1890); *An American Girl in London* (New York, 1891); *The Simple Adventures of a Memsahib* (New York, 1893).

NEIL MACDONALD.

Duncan, WILLIAM WALLACE, D. D.: bishop of the M. E. Church South; b. at Boydton, Va., Dec. 20, 1839; graduated at Randolph College, Va., 1858; held pastorates in the M. E. Church: elected, June, 1875, Professor of Metaphysics and Political Economy in Wofford College, S. C.; member of œcumenical conference in London 1881; elected bishop May, 1886. C. H. T.

Duncker, doon'ker, MAXIMILIAN WOLFGANG: historian; b. in Berlin, Germany, Oct. 5, 1811; educated there and at Bonn, but in the latter place, becoming implicated in the democratic movements, he was arrested and condemned to six years' imprisonment, but was very soon pardoned. He became Professor of History at Halle in 1842, a member of the German National Assembly in 1848, professor at Tübingen in 1857, and received an appointment as keeper of the Prussian archives in 1861. Among his works are *Origines Germanicæ* (1840); a *History of Antiquity* (1852), his principal work, translated into English (6 vols., 1877–82); *Die Krisis der Reformation* (Leipzig, 1846); *Zur Geschichte der deutschen Reichsversamlung* (1849); *H. von Gagern* (1850); *Vier Monate auswärtiger Politik* (1850); *Feudalität und Aristokratie* (1858). On Jan. 1, 1875, he retired to private life, having accomplished the incorporation of the archives of Hesse, Nassau, and Hanover with those of Prussia. D. at Anspach, July 22, 1886.

Duncombe, dŭn'kŭm, THOMAS SLINGSBY: English radical; b. in 1797; elected to Parliament in 1826. He represented Finsbury from 1834 to 1861, advocated the vote by ballot, extension of suffrage, and other reforms. He was a witty, fluent, and popular speaker. He made in 1858 a motion which resulted in the relief of the Jews from political disabilities. D. Nov. 13, 1861.

Dundalk': seaport-town; capital of the county of Louth, Ireland; at the mouth of Castleton river and on Dundalk Bay; 50 miles N. of Dublin, with which it is connected by railway (see map of Ireland, ref. 7–I). It has a safe harbor, which admits vessels drawing 16 feet of water. The chief articles of export are linen, timber, iron, dairy products, and live stock. Here are manufactures of salt, soap, pins, leather, starch, etc. Edward Bruce took Dundalk in 1315, and held his court here until he was killed in 1318. Pop. (1891) 13,207.

Dundas': town (settled in 1801, incorporated in 1848); Wentworth co., Ontario, Canada (for location, see map of Ontario, ref. 5–D); situated on Grand Trunk Ry., and also on Desjardins Canal; 50 miles from Hamilton and 43 miles from Toronto; has five churches, high school, water-works, mills, and manufactories. Dundas is a manufacturing town, surrounded by a fine agricultural region. Pop. (1881) 3,709; (1891) 3,546. PROPRIETOR OF "BANNER."

Dundas, HENRY, Viscount Melville: British statesman; b. in Edinburgh, Apr. 28, 1742; admitted to the bar 1763; was returned to Parliament for Midlothian 1774, and made lord advocate for Scotland 1775. His political record is more creditable to his ability than to his consistency. Though his constituents opposed the ministry, he supported Lord North's administration, and favored the war with the American colonists in opposition to Pitt. He continued in office under the Rockingham ministry, and when Pitt came in power became one of his ablest and most faithful allies against his former associates. He was foremost in carrying Pitt's India bill through Parliament (1784), and was made president of the board of control established by this measure. To his searching investigation of Indian affairs is partly due that movement for reform which culminated in the trial of Hastings (1786). He was appointed principal Secretary of State for the Home Department in 1791, and held several other important offices, but resigned with Pitt in 1801. Accused of malversation in office he was acquitted on his trial and completely vindicated, despite the energy and talents of his political enemies (1806), but after this he lived in retirement. D. in Edinburgh, May 28, 1811.

F. M. COLBY.

Dundas's Strait: a strait of Northern Australia: separates Melville island from Coburg peninsula, and is 18 miles wide.

Dundee' (Lat. *Taodunum*): a city and seaport of the county of Forfar, Scotland; finely situated on the north side of the wide estuary of the Tay; 10 miles from the sea and 50 miles by water N. N. E. of Edinburgh; lat. 56° 27′ 36″ N., lon. 2° 57′ 45″ W. (see map of Scotland, ref. 10–I). The principal public edifices are the royal exchange, opened in 1856, the corn exchange, St. Paul's church, with a tower and spire 217 feet high, the infirmary and town hall, and Kinnaird hall. Here is a remarkable tower 156 feet high, built in the twelfth century, to which three parochial churches under one roof have been annexed. Dundee has a university college, opened in 1883, a theater, a public library, and an asylum for the insane. There are several large parks. It is the chief seat in Britain of the manufacture of linen fabrics—from the finest damasks down to osnaburgs, sheetings, ducks, dowlas, drills, and canvas. It has also manufactures of machinery, jute, confectionery, and marmalades. The annual value of the flax, hemp, and jute manufactures of Dundee is about £5,500,000. Dundee has a number of ship-building yards, and an excellent harbor with extensive docks which cost upward of £700,000. It is the center of the whale and seal fishing trade of Great Britain, and the number of vessels of all kinds entering the port is very large. It has direct railway communication with the south by the Tay bridge, 3,593 yards long. Dundee is a place of great antiquity, and was one of the places of residence of the Scottish kings. It became a stronghold of Protestantism during the Reformation. It was burned by the Duke of Lancaster in 1385, and sacked and burned by Gen. Monk in 1651. Pop. (1891) 155,640; (1901) 160,871.

Dundee: village and railway junction; Monroe co., Mich. (for location, see map of Michigan, ref. 8–K): has four churches, union school, flouring-mills, furniture-factory, creamery, cheese-factory, stone-quarry, etc. It is situated in a rich farming, fruit-growing, and stock-raising region. Pop. (1880) 932; (1890) 1,166; (1900) 1,118. EDITOR OF "REPORTER."

Dundee: village; on railway; Yates co., N. Y. (for location of county, see map of New York, ref. 5–E); about 12 miles from Penn Yan, and 32 miles N. by W. from Elmira. It has an academy, furnace, mills, etc. Pop. (1880) 1,025; (1890) 1,200; (1900) 1,291. EDITOR OF "OBSERVER."

Dundon'ald, EARLS OF (1669): Barons Cochrane (Scotland, 1647).—THOMAS COCHRANE (*q. v.*), tenth Earl of Dundonald; b. Dec. 14, 1775; succeeded his father July 1, 1831; d. Oct. 31, 1860, and was succeeded in turn by his son, THOMAS BARNES, eleventh earl (b. Apr. 18, 1814; d. Jan. 15, 1885), and his grandson. DOUGLAS MACKINNON BAILLIE HAMILTON COCHRANE, twelfth earl, son of Thomas Barnes; b. Oct. 29, 1852.

Dune [viâ Fr. *dune*, from Celt. *dūn*, (O. Fr.) hill, tower, and a doublet of Eng. *down*, hill < O. E. *dūn* = O. Ir. *dūn*]: a hill of sand, heaped up by the wind. Dunes are found in various situations: (1) Along coast lines, especially where the prevailing winds blow on shore; the sands delivered by the waves are then carried out of their reach by the winds, forming hills often a hundred or more feet in height: a great accumulation of such dunes is found along the shore of Southwest France, where they have forced villages to retreat before their inland advance; their movement is much reduced by planting pine trees, which shelter the sand from the wind. Similar dunes occur on the sand-bars or "beaches" that fringe the Atlantic coast of the U. S., and also on the southeast shore of Lake Michigan. (2) In desert regions, where aridity excludes vegetation and allows the wind to carry about the fine products of rock disintegration. The coarser stones are left in place; the finer dust is blown far away; the sand is drifted into dunes, sometimes several hundred feet in height. Extensive areas in the Sahara and in the deserts of Arabia, Persia, Central Asia, Western North America, etc., are covered by hills of drifting sand; their form is sometimes crescentic, convex to the wind. (3) In relatively dry regions, as the western plains of the U. S., dunes are frequently formed on the leeward banks of rivers where the sand is blown from the river channel at times of low water. W. M. DAVIS.

Dunedin, dŭn-ee'din: city (founded in 1848); capital of Otago, and the most important commercial center of New Zealand; situated at the head of Otago harbor, on the southeast coast of the Middle isle; lat. 45° 50′ S., lon. 170° 36′ E. The site is somewhat hilly, but the streets are well paved; the city has street railways and water-works, and is lighted by gas. It contains many handsome churches and public buildings, beautiful botanical gardens, and manufactures of woolen goods. Here also is the University of Otago, now affiliated with that of New Zealand. It is the seat of Anglican and Roman Catholic bishoprics. The chief export is wool. Pop., with suburbs (1896) 47,280.

Dunferm'line: a handsome royal burgh of Fifeshire, Scotland; on a long ridge 3 miles from the Firth of Forth and 15 miles N. W. of Edinburgh (see map of Scotland, ref. 11–H). Among noteworthy structures are the new abbey church, corporation buildings, the high school, St. Margaret's hall, the Carnegie public library, and the Carnegie baths. It derives its prosperity chiefly from manufactures of linen, cotton, worsted, iron, etc., and is said to be unrivaled by any British town in the manufacture of damask linen. Here are also several iron-foundries, collieries, dye-works, and bleaching-works. Dunfermline was a town as early as 1100 A. D. Malcolm Canmore founded here about 1080 a Benedictine abbey, of which some ruins are still visible. Here was also a regal palace of the Stuarts, now ruined. Robert Bruce was buried at Dunfermline. Pop. (1891) 22,365; (1901) 25,250.

Dunfish: in the U. S., codfish cured in such a manner as to give them a "dun" color. Fish for "dunning" are caught in February or in early spring. They are taken in deep water, are split and incompletely salted, then laid in a pile for two or three months in a dark place, covered with salt hay, eel-grass, etc., and pressed by some weight. They are then uncovered and closely packed for several months, when they are ready for use. They acquire a peculiar flavor, which is greatly liked by many.

Dungar'van: a seaport and bathing-place of the county of Waterford, Ireland; on Dungarvan Bay; 40 miles E. N. E. of Cork (see map of Ireland, ref. 13–G). Its harbor admits only small vessels. It has three convents, and an old castle now used as barracks. It has important fisheries, and exports fish, grain, butter, and cattle. Pop. 7,000.

Dung-beetle: a name given to many coleopterous insects of the family *Scarabæidæ* and of the genera *Copris*, *Phaneus*, *Aphodius*, *Geotrupes*, *Bolbocerus*, *Trox*, and others. Some of these insects inclose their eggs in pellets or globes of manure. There are many species in America, Europe, Asia, and Africa. The sacred scarabæus of the Egyptians was a true dung beetle, the *Ateuchus sacer* of the Old World.

Dunglison, ROBLEY, M. D., LL. D.: physician; b. at Keswiek, England, Jan. 4, 1798; received his medical education at London and Erlangen; Professor of Medicine in the University of Virginia 1824–33; of Therapeutics in the University of Maryland 1833–36; and of the Institutes of Medicine in the Jefferson Medical College, Philadelphia, 1836–68. He published about twenty volumes, among which are *Human Physiology* (1832); a *Dictionary of Medical Science and Literature* (Boston, 1833; later ed. 1874); and *Therapeutics and Materia Medica* (1836; 6th ed. 1857). D. in Philadelphia, Apr. 1, 1869.

Dunkeld': a small town of Perthshire, Scotland; situated on the Tay (see map of Scotland, ref. 9–H), in a vale inclosed by mountains; 15 miles N. N. W. of Perth. The cathedral, built on the site of an ancient Culdee monastery, was completed in 1501, several centuries after the foundation of Dunkeld, which had become the seat of a bishopric in 1127. Here is the mansion of the Duke of Athole, with the largest and finest park in Scotland, including 20 sq. miles of lareh woods. Pop. about 800.

Dunkers, dŭng'kerz, **Dunkards**, -ardz, or **Tunkers**, tŭng'kerz [*Dunker* is a dialectic form of Germ. *Tunker*, dipper, deriv. of verb *tunken*, dip < O. H. Germ. *dunchōn*, *tunchōn*, cf. Lat. *tingere*, Gr. τέγγειν, moisten, wet]: a sect of German-American Baptists, called by themselves **Brethren**, said to have been founded at Schwarzenau in Westphalia by one Alexander Mack in 1708, and named from their manner of baptism by trine immersion of believers. Having been driven from Germany by persecution between 1719 and 1729, they settled in Pennsylvania, and subsequently in Ohio, Indiana, Maryland, Virginia, and several other States. Their doctrines are similar to those of the Mennonites, and in the simplicity of their dress and speech they somewhat resemble the Society of Friends. From the Dunkers as a sect must be distinguished the Seventh-day Dunkers, commonly called *German Seventh-day Baptists*.

Dun'kirk (Fr. *Dunkerque*): a fortified seaport-town in the extreme northern part of France; in the department of Nord, and on the Strait of Dover; about 40 miles N. W. of Lille and 46 miles E. of Dover; lat. 51° 3′ N., lon. 2° 22′ E. (see map of France, ref. 1–F). It is the northern terminus of the Chemin de Fer du Nord. It is well built, with wide and well-paved streets, and is defended by a citadel and ramparts. The harbor is shallow, but the roadstead is large and safe. Dunkirk has several fine churches, a college, a theater, a public library, and a town-hall; metal-foundries, salt-refineries, and ship-building yards; also manufactures of linen, cotton, beet-root sugar, soap, starch, cordage, and leather. It became a free port in 1826, since which it has had an active trade in wines, liqueurs, etc. Its fisheries are very important. A church is said to have been built here in the seventh century among the sandhills or dunes, and hence its name, which signifies "church of the dunes." Dunkirk was burned by the English in 1388 and was taken by them in 1658, but was sold to the French king by Charles II. in 1662. Pop. (1881) 37,528; (1891) 39,498.

Dunkirk: city, port of entry, and railway center; Chautauqua co., N. Y. (for location of county, see map of New York, ref. 6–B); situated on Lake Erie, 40 miles S. W. of Buffalo. It is the western terminus of the Erie R. R., which connects it with New York city, 459 miles distant, and has a good harbor and an advantageous position for trade. It has an orphan asylum, free library, extensive locomotive-works, a foundry, large planing-mills, a coal elevator, a grain elevator, various mills and factories, gas and electric lights, the Holly system of water-works, and electric street railways. Pop. (1880) 7,248; (1890) 9,416; (1900) 11,616.

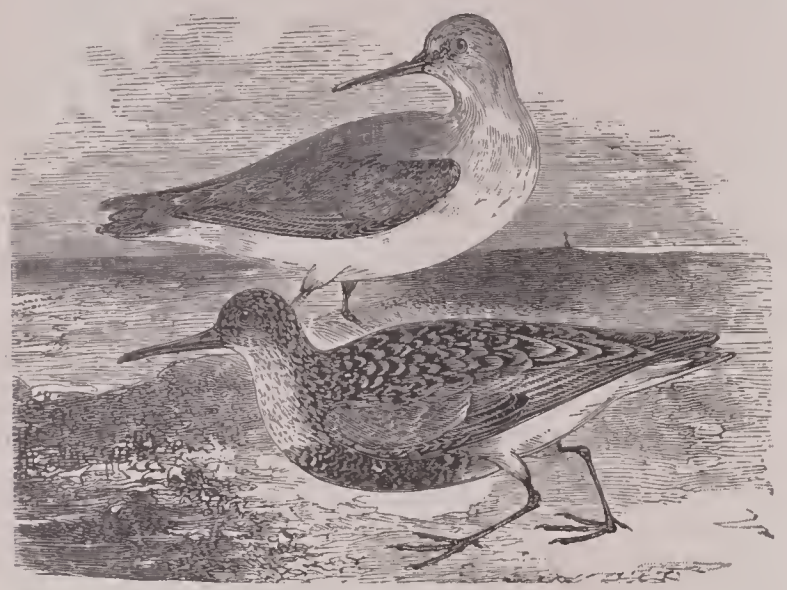
EDITOR OF "OBSERVER-JOURNAL."

Dunlap: town; Harrison co., Ia. (for location of county, see map of Iowa, ref. 5–C); situated on Ch. and No. West. Railway, 47 miles N. E. of Omaha; has 6 churches and 2 schools. Its principal industry is agriculture. Pop. (1880) 1,246; (1890) 1,088; (1900) 1,355.

EDITOR OF "REPORTER."

Dunlap, William: painter and writer; b. at Perth Amboy, N. J., Feb. 19, 1766. Among his paintings are *Christ Rejected* (1821) and *Calvary* (1828). He was one of the earliest dramatic writers in the U. S., and from 1798 to 1805 was manager of the Park Street theater in New York. Among his plays are *The Father*, a comedy, acted in 1789, and *Leicester* (1794), the first American tragedy regularly produced. Among his other works are *Life of Charles Brockden Brown* (1827); *History of the Rise and Progress of the Arts of Design in the United States* (1834); and a *History of the American Theater* (1832). D. in New York, Sept. 28, 1839. Revised by H. A. Beers.

Dunlin, called also **Sea Snipe** and **Oxbird**: a sandpiper (*Tringa alpina*) found in most parts of Europe, and occurring as a straggler in Greenland. It is about 8 inches long, and is of a black, rufous, and gray color on the back, and black and white beneath. A distinct geographical race, or



The dunlin.

sub-species (*Tringa alpina pacifica*), inhabits North America, breeding in the northern portions and migrating southward in winter. Dunlins are nimble-limbed birds, always on the move, keeping close to the water's edge, running along the sands, pecking eagerly at mollusks and worms.
Revised by F. A. Lucas.

Dunmore: borough; Lackawanna co., Pa. (for location of county, see map of Pennsylvania, ref. 3–L); situated on the Erie and Wyoming Valley Railroad, 2 miles N. E. of Scranton. It derives its prosperity chiefly from coal-mining. Pop. (1880) 5,151; (1890) 8,315; (1900) 12,583.

Dun'net Head: a rocky peninsula of Caithness, Scotland, 100 to 600 feet high; the most northern point of Great Britain. Here is a lighthouse 340 feet above the sea.

Dunnville: a town and port of entry of Monck co., Ontario, Canada; on the Grand river; 43 miles by rail W. of Buffalo and 40 miles S. of Hamilton (see map of Ontario, ref. 5–E). It has several mills, a foundry, and a considerable lumber and grain trade. Pop. 1,808.

Dunois, dü'nwăă', Jean, known as the "Bastard of Orleans": soldier of the Hundred Years' War (*q. v.*); b. in Paris, Nov. 23, 1402; the natural son of the Duke of Orleans, brother of Charles VI. As the deliverer of France from the English he stands forth as the most prominent French warrior of the fifteenth century. His first important achievement was the defeat of the English at Montargis in 1427. In the following year he occupied Orleans, which he held against the English till Joan of Arc came to his relief, and to Dunois as well as to the Maid belongs the honor of the victory at that place in 1429. He was again victorious with her at Patay, and though checked for a time by her capture and death, he renewed the war with all his former vigor and success, capturing Chartres, forcing Bedford to raise the siege of Lagny, and driving the English out of all French territory except Normandy and Guienne. These provinces were attacked 1449–51; two months sufficed for him to sweep the English from the former, and by 1455 Calais was the sole reminder of foreign domination. As a reward for his services Dunois was legitimated by Charles VII., who gave him the title of defender of his country and the office of grand chamberlain. His revolt under Louis XI. caused the loss of his dignities, but they were restored to him under the treaty of Conflans (1465), and he was named president of the council for the reform of the state. D. Nov. 24, 1468.
F. M. Colby.

Dunraven, Wyndham Thomas Wyndham Quin, Fourth Earl of: b. at Adare Abbey, Feb. 12, 1841; educated at Christ Church, Oxford; entered the First Life Guards 1865; was war correspondent for the *Daily Telegraph* in Abyssinia 1867, and again in the Franco-German war; succeeded to the title 1871; Under Secretary for the Colonies in Lord Salisbury's two administrations, but resigned Feb., 1887.

Duns, John, D. D., F. R. S. E.: minister of the Free Church of Scotland; b. in Duns, Berwickshire, in 1820; educated at the University of Edinburgh. After some work in the pastorate he was, in 1864, appointed to the chair of Natural Science in New College, Edinburgh. He has published *Biblical Natural Science*; *Science and Christian Thought*; *Life of Sir James Simpson*; *Life of Professor Fleming*; *Life of the Rev. Samuel Martin*; *Creation according to Genesis and the Confession of Faith*; and a very large number of papers read before the Royal Society of Edinburgh, the Royal Physical Society, the Society of Antiquaries of Scotland, and the Victoria Institute. He is a contributor to the *North British Review*, of which he was for four years the editor; was Rhind lecturer in Archæology 1890; and is a member of several American scientific societies. Willis J. Beecher.

Duns Sco'tus, Joannes: surnamed The Subtle Doctor; theologian and scholastic philosopher, about whose life nothing is really known. The following statements are traditional. He was born about 1265; is claimed as their countryman by the Scots, the English, and the Irish. He was of gentle blood, studied at Oxford, became a Franciscan friar, and in 1301 Professor of Theology at that place. In 1304 he removed to Paris, where he taught theology with great distinction. He wrote many works on theology and metaphysics, and was a realist in philosophy. He affirmed, against Thomas Aquinas, that the existence and nature of God can not be proved by reason, but is known only through revelation; that the will is absolutely free; and that the faculties of the soul are not subjectively distinct from each other, but are constant modes of action of a unit of existence. In theology he favored the doctrine of the immaculate conception of the Virgin Mary. He was the founder of a school called Scotists, who maintained for several centuries a controversy with the Thomists (i. e. the disciples of Aquinas). D. at Cologne, Nov. 8, 1308. His works, with a *Life*, were edited by Luke Wadding (12 vols. fol., Lyons, 1639). See Scholasticism.

Dunstan, Saint: an English prelate; b. at Glastonbury in 925 A. D. He was a man of extraordinary abilities, and gained renown by his ascetic piety. Of gentle birth and dauntless courage, he acquired the favor of Edred, who began to reign in 946 A. D., and he took a prominent part in the government during his reign. He was banished by Edwy in 955, but obtained the chief power under Edgar, who became king in 959 and appointed Dunstan Archbishop of Canterbury. Dunstan enriched and exalted the monks, in learning, religion, and morals, and deprived the married clergy of their class privileges. On the accession of Ethelred in 978 his political power was lost, but he kept the archbishopric. D. in Canterbury, May 19, 988. See *Memorials of St. Dunstan*, ed. W. Stubbs (in the Rolls series).
Revised by Samuel Macauley Jackson.

Dunster, Henry: the first president of Harvard College; b. in Lancashire, England; educated at Magdalen College, Cambridge (B. A. 1630). To escape persecution he emigrated to New England in 1640, and entered upon his presidency Aug. 27 of that year. In 1654 he was compelled to resign, in consequence of having borne public testimony against the baptism of infants, for which offense he was afterward tried by a jury and placed under bonds. Still later, he was again presented by the grand jury for neglect to have one of his children baptized. He removed to Scituate, Mass., and preached there until his death. He was esteemed for learning and piety. He assisted in the preparation of the *New England Psalm-book* (1640). He secured the charter of 1650, and, it is supposed, obtained that of 1642. D. at Scituate, Feb. 27, 1659. See his *Life* by J. Chaplin (Boston, 1872).

Dunton, John: eccentric English writer and Dissenter; b. at Graffham, May 4, 1659. He opened a bookstore in London about 1685, but failed in business. He published *The*

Athenian Mercury (1690–96); and wrote, beside other works, the *Dublin Scuffle* (1699) and *The Life and Errors of John Dunton, with the Lives and Characters of a Thousand Persons*, containing an account of a visit to Boston and Salem, and sketches of ministers and prominent citizens of New England in 1685 (1705; new ed. 1818). D. in 1733.

Dunwoody, Major Henry Harrison Chase: meteorologist; b. in Highland co., O., Oct. 23, 1842; removed to Iowa in 1849; graduated at the U. S. Military Academy in 1866, when he was appointed second lieutenant of the Fourth Artillery. He served with his regiment from 1866 to 1871, and was made first lieutenant in 1867. In 1872 he was detailed for duty in the Signal Corps, and to the Weather Bureau on its formation in 1891. He has been chiefly employed in work pertaining to meteorology, and especially in the official forecast of the weather—a work for which he has been especially commended in numerous official reports. He originated the system of cold-wave warnings, and in 1887 recommended the organization of State weather services. In 1889 he obtained the rank of major, on the score of the importance and usefulness of his work in the Signal Corps. He is a graduate of the Columbia Law School (1876). He is the author of many papers published by the Signal Service. Among them may be mentioned *Decrease of Temperature with Elevation and Reduction of Barometer to Sea-level*; *Tables of Rainfall and Temperature compared with Crop Production*; *Weather Proverbs*; *Geographical Distribution of Rainfall in the United States*; *Absolute Humidity and Mean Cloudiness in the United States*; *Rainfall in the United States for each month, from January, 1870, to December, 1873, Based on Reports from Voluntary Observers.*

Mark W. Harrington.

Duodecimals, called also **Cross-multiplication** [*Duodecimals* is from Lat. *duode'cimus*, twelfth; *duo'decim*, twelve]: the name given to a method by which the area of a rectangular surface is calculated when the length and breadth are stated in feet, inches, and lines. It is principally used by artificers in finding the contents of their work. The operation is performed by substituting the duodecimal scale of notation for the decimal.

The Duodecimal Scale is the scale of notation obtained by the division of magnitudes into twelve equal parts. Computation in this manner has some advantages, as 12 admits of so many divisors—viz., 2, 3, 4, and 6; but the decimal scale, which coincides with our arithmetical system is now preferred, though still not adopted universally.

Duode'num [Mod. Lat., from Lat. *duode'ni*, twelve each, so named because in man it is about 12 finger-breadths long]: that part of the small intestine which is nearest the stomach. In man it is 8 or 10 inches in length. It is the widest, shortest, and most fixed part of the small intestine, having no mesentery. It is somewhat horseshoe-like in form, the convexity to the right. It receives the secretions of the liver and the pancreas. Its muscular fibers are more numerous than in the rest of the small intestine.

Dupanloup, dü'păn'loo', Félix Antoine Philibert: bishop; b. at St.-Félix, near Annecy, in Savoy, Jan. 3, 1802. He studied in Paris, and was ordained a priest in 1825. In 1827 he became confessor to the Count of Chambord, in 1828 catechist to the Orleans princes, and in 1830 almoner to Madame la Dauphine, but retired from all those positions after the Revolution, and was appointed superior of the diocesan seminary of Paris. He became Bishop of Orleans in 1849, and was admitted into the French Academy in 1854. He belonged to the Gallican party, vigorously opposed the infallibility dogma, but accepted it, submitting to the decisions of the Council of the Vatican. He fought ardently for free education, and wrote, besides other works, a popular treatise on education, *De l'éducation* (3 vols., Paris, 1855–57; 10th ed. 1882). Among his other writings, which are very numerous, the most noticeable are *Le Mariage chrétien* (1868; 7th ed. 1885); *Histoire de notre Seigneur Jesus-Christ* (1869), etc. In 1871 he was elected a member of the National Assembly. He was nominated Archbishop of Paris in 1871, but declined that office. D. at Lacombe, near Lancey, Isère, Oct. 11, 1878. See his *Life* by F. Lagrange (3 vols., Paris, 1883–84; 5th ed. 1886; Eng. trans., 2 vols., London, 1885).

Duparquet, Jacques Diel: See Diel du Parquet.

Duperré, dü'păr'rā', Victor Guy, Baron: admiral; b. at La Rochelle, France, Feb. 20, 1775. He gained the rank of viee-admiral in 1826, and commanded the fleet which aided the army to conquer Algiers in 1830, and was made admiral. D. Nov. 2, 1846.

Duperrey, dü'păr'rā', Louis Isidore: navigator and hydrographer; b. in Paris in 1786; conducted an exploring expedition in 1822 to the islands of the Pacific; surveyed the coasts of New Zealand and parts of Australia; returned in 1825, and published *Voyage autour du Monde sur la corvette La Coquille* (1826–30).

Duperron, -rōń', Jacques Davy: cardinal; b. at St.-Lô, France, in 1556; educated in Switzerland by his father, a Protestant fugitive from perseeution; went to Paris, where his talents attracted the notice of the Count of Matignon and the poet Desportes. Having abjured Protestantism, he was appointed reader to the king. Though a layman he was chosen to preach before the court, and was induced by the success of his sermons to take orders. He was selected to deliver the funeral oration on Mary Queen of Scots, and though his strictures upon Queen Elizabeth were formally disavowed by the king, Duperron lost nothing by his vehemence. After the death of Henry III. he attached himself to the Cardinal de Bourbon, whose secrets he is accused of having sold to Henry IV. On the latter's accession he was appointed Bishop of Evreux, and as one of those chosen to instruct the king in the Roman Catholic faith is said to have been the chief instrument in his conversion. With Cardinal d'Ossat at Rome he procured the withdrawal of the interdict that had been placed on the kingdom, and the cardinal's hat was bestowed upon him in the same year (1604). D. in Paris, 1618. Besides controversial works he wrote ballads, poetical satires, and a poem entitled *l'Ombre de l'amiral de Joyeuse.*

F. M. Colby.

Dupetit-Thouars, dü'pe-tee'too'aar', or **Petit-Thouars**, Abel Aubert: admiral; b. in France, Aug. 13, 1793; son of Aristide Aubert Dupetit-Thouars, captain of the ship Le Tonnant, destroyed in the battle of the Nile (1798). He was appointed commander of the French naval forces in the Pacific Ocean, and seized the island of Tahiti in 1842, but this act was disavowed by his Government. He published *Voyage autour du Monde* (10 vols., 1841–49).

Dupin, dü'păń', Amantine Lucile Aurore: See Sand, George.

Dupin, André Marie Jean Jacques: lawyer and statesman; b. at Varzy, Nièvre, France, Feb. 1, 1783. He gained distinetion as the advocate of Marshal Ney, Béranger, and other persons tried for political offenses. In 1826 he was elected a member of the Chamber of Deputies, in which he acted with the liberals. He promoted the revolution of 1830 and the accession of Louis Philippe. He was chosen president of the Chamber of Deputies eight times between 1832 and 1848, and was admitted into the French Academy in 1832. In Feb., 1848, he supported the Count of Paris as the successor to Louis Philippe, but he recognized the republic which was then formed. He was a prominent member of the Constituent Assembly, and was president of the Legislative Assembly in 1849. In 1857 he was appointed procureur-général of France. He published *Mémoires et Plaidoyers* (20 vols., 1806–30). D. Nov. 10, 1865.

Dupin, François Pierre Charles, Baron: geometer; a brother of A. M. J. J. Dupin; b. at Varzy, France, Oct. 6, 1784; visited England in 1816; published *Voyages dans la Grande Bretagne* (Travels in Great Britain, 6 vols., 1820–24), and became Professor of Mechanics at the Conservatoire des Arts et Métiers in 1810. He wrote on geometry and mechanics, and did much to advance the useful arts and improve the condition of the laboring people. In the legislature his labors were extensive. He was an Orleanist. D. Jan. 18, 1873.

Dupin, Louis Ellies: Jansenist theologian; b. in Paris, June 17, 1657; educated there; embraced Jansenism 1703, and thereby lost his chair of Philosophy in the College of France. His great work is *A New History of Ecclesiastical Writers* (47 vols., Paris, 1686–1714; 2d ed. 19 vols., 1690–1715; Eng. trans., 17 vols., London, 1693–1707; 3d ed. 3 vols., Dublin, 1722–24). D. in Paris, June 6, 1719.

Dupleix, dü'plā', Joseph, Marquis: French colonial governor; b. about 1695. He amassed a fortune by commercial operations in India, and in 1742 was appointed governor of Pondicherry and all the French possessions in India. He formed the project of founding a European empire in that country, and soon made himself master of the Carnatic, partly by fighting and partly by political intrigues. He was opposed by the British general Clive, who defeated the

French in several battles. Dupleix was removed from the command in 1754, and returned to France, where he died in 1763.

Du Plessis-Mornay, dü′plās′see′mōr′nā′, Philippe: a leader of the French Protestants; b. at Buhy, Normandy, Nov. 5, 1549; was an intimate friend of Henry IV., for whose cause he fought with sword and pen. After the conversion of Henry IV. to Romanism, however, the friendship cooled. Several of his treatises have been translated into English: *Discourse of Life and Death* (London, 1576) and *Treatise of the Church* (1579); *The Trueness of the Christian Religion* (London, 1587). One of his most favorite treatises is *The Mystery of Iniquity* (1612), a violent attack on the papacy, written in the latter part of his life. D. at La Forêt-sur-Sèvre, Nov. 11, 1623.

Duplicate Whist: See Whist.

Duponceau, dü′pōṅ′sō′, Pierre Étienne, LL. D.: lawyer and scholar; b. at St.-Martin, island of Rhé, France, June 3, 1760; emigrated to the U. S. in 1777, and served in the army as aide-de-camp to Baron Steuben; practiced law in Philadelphia with distinction, and was president of the American Philosophical Society. He wrote on philosophy and other subjects. In 1838 he published a work on Indian languages. D. in Philadelphia, Apr. 1, 1844.

Du Pont, Henry: second son of Eleuthère Du Pont de Nemours; b. near Wilmington, Del., Aug. 8, 1812; graduated at the U. S. Military Academy, and entered the army as brevet second lieutenant of artillery in 1833, from which he resigned in 1834, and became proprietor of the celebrated powder-mills bearing his name near Wilmington, Del., which under his direction grew to immense size, and became an important factor in the civil war. For many years he was adjutant-general of the State of Delaware, and during the civil war served as major-general of militia in command of the militia of the State, by his prompt and decisive action contributing very largely to securing the State's allegiance to the Union. He was presidential elector in the years 1868, 1876, 1880, 1884, and 1888. D. Aug. 8, 1889.

James Mercur.

Dupont, dü′pōṅ′, Pierre: song-writer; b. in Lyons, France, Apr. 23, 1821. He composed the words and airs to his poems at the same time. Among his works are *Les deux anges* (The Two Angels, a poem, 1842) and *Le chant des ouvriers* (Song of the Workers). D. in Lyons, July 25, 1870.

Du Pont, Samuel Francis: rear-admiral U. S. navy; of French descent; b. at Bergen Point, N. J., Sept. 27, 1803; entered the navy as a midshipman Dec. 19, 1815; was in command of the Cyane on the west coast of Mexico during the Mexican war; became captain in 1855, and two years later went on special service to China in command of the Minnesota. In Sept., 1861, he was appointed flag officer, led the expedition that sailed from Norfolk the following month, and successfully attacked the fortifications defending Port Royal harbor on Apr. 7, 1863. He made a brilliant but unsuccessful attempt to take Charleston. In July, 1863, being relieved from the command of the South Atlantic fleet, he returned to his home, where he died on June 23, 1865.

Dupont de l'Étang, -de-lā′taṅ′, Pierre: French general; b. at Chabannais, July 14, 1765; aided in the victory of Marengo; defeated a superior Austrian force at Pozzolo on the Mincio; served with distinction at Jena (1806) and Friedland (1807). Having obtained the command of an army in Spain, he was defeated at Baylen in June, 1808, by De Castaños, who took from him 18,000 prisoners. For this ill-success he was disgraced and imprisoned, but his condemnation was annulled on the return of Louis XVIII., who appointed him Minister of War. He was dismissed from this office, but after the second restoration was appointed member of the privy council, and afterward elected several times to the Chamber of Deputies from his department. D. in Paris, Feb. 16, 1838.

Dupont de l'Eure, -de-lör′, Jacques Charles: statesman and lawyer; b. at Neubourg, France, Feb. 27, 1767; was a friend of the Revolution, and remarkable for his consistent advocacy of liberal principles throughout his political career. He was a member of the Council of the Five Hundred in 1798, and of the Corps Législatif in 1813. As vice-president of the Chamber of Deputies during the Hundred Days, he showed admirable firmness in opposing the reactionary projects of the allies. From 1817 to 1848 he was continuously a member of the Chamber of Deputies. In 1848 he was made president of the provisional government, but failing of a re-election to the chamber in the following year retired to private life. D. in Paris, Mar. 3, 1855.

F. M. Colby.

Dupont de Nemours, dü′pōṅ′de-ne-moor′, Pierre Samuel: economist; b in Paris, Dec. 14, 1739; was of the school of economists represented by Quesnay and Turgot, and associated in office with the latter, 1774, sharing in his schemes of reform; became a member of the National Assembly in 1790, where he sided with the constitutional monarchists. The effect of his steadfast opposition to the excesses of the mob was to mark him out for vengeance after Aug. 10, 1792, but he escaped the guillotine, was released from prison after the death of Robespierre, and afterward elected to the Council of Five Hundred. He emigrated to the U. S. in 1799, returned to France in 1802, and the esteem in which he was held in both countries is shown by his election to arrange the Louisiana purchase in 1803. He refused to take office under Napoleon, and emigrated to Delaware in 1815. He wrote several treatises on political economy and natural history, the *Philosophie de l'Univers* (1796), and contributed a number of papers to the Institute, of which he was a member. D. near Wilmington, Del., Aug. 6, 1817.

Dupré, dü′prā′, Jules: landscape and marine painter; b. at Nantes in 1812; studied design as a boy in his father's porcelain-manufactory, and taking up painting by himself exhibited five landscapes at the Salon of 1831. He received second-class medals, Salons, 1833 and 1849, and Paris Exposition, 1867; medal of honor, Paris Exposition, 1889; officer Legion of Honor 1870; one of the great landscape-painters of the Romantic school. His work is very individual in method, and is notable for fine qualities of color and unity of effect. His marines are often hard and stony in the painting of the water, but are handsome as color harmonies. *Morning* and *Evening* are in the Luxembourg Gallery, Paris. D. in Paris, 1889. William A. Coffin.

Dupré, Julien: landscape and figure painter; b. in Paris, Mar. 17, 1851; pupil of Pils, Lehmann, and Langée; second-class medals, Salon, 1881, and Paris Exposition, 1889; Legion of Honor 1892; medal, Centennial Exposition, Philadelphia, 1876. His pictures depict peasant-life, and are painted with frank, simple methods; strong draughtsman and careful observer of nature. *Mowing Clover* (1880) and *The Refractory Cow* (1885) are in Luxembourg Gallery, Paris; *The Pasture* in the museum at St. Louis, Mo. Studio in Paris.

W. A. C.

Dupuis, dü′pü-ē′, Charles François: philosopher: b. at Trie-le-Château, Oise, France, Oct. 16, 1742. He became Professor of Rhetoric in the College of Lisieux in 1766, and was a friend and pupil of Lalande, the astronomer. His *Origine de tous les Cultes, ou la Religion Universelle*, contains bold speculations on religion. D. Sept. 29, 1809.

Dupuis, Nathan Fellowes: See the Appendix.

Dupuytren, dü′pü-ē′traṅ′, Guillaume, Baron: surgeon and anatomist; b. at Pierre-Buffière, France, Oct. 6, 1777; became Professor of Surgery in Paris in 1811. He was reputed the most skillful French surgeon of his time, made important discoveries in morbid anatomy, and invented several useful instruments. D. Feb. 8, 1835. See Cruveilhier, *Vie de Dupuytren* (1841).

Duquesne, dü′ken′, Abraham, Marquis: French naval commander; b. at Dieppe in 1610. He served with distinction against the Spaniards at Tarragona in 1641. In 1643 he defeated the Danes near Gothenburg, and compelled them to make peace. He defeated the Spanish and Dutch fleet under De Ruyter in the Mediterranean, near Catania, in April, 1676. D. in Paris, Feb. 2, 1688. See André Richer, *Vie du Marquis Duquesne* (1783).

Duquoin, dyu-kwoin′: city and railway junction: Perry co., Ill. (for location of county, see map of Illinois, ref. 10–E); 76 miles N. of Cairo. It has a graded school, a park, a public library, a foundry, machine-shops, salt-works, a flouring-mill, fourteen coal mines, and gas-works. Pop. (1880) 2,807; (1890) 4,052; (1900) 4,353.

Editor of "Tribune."

Du'ra Ma'ter [Lat. *dura*, femin. of *durus*, hard; *mater*, mother—so named because it is more unyielding than the pia mater]: the outermost of the three meninges or membranes enveloping the brain and spinal cord in vertebrate animals. Within the skull the dura mater is closely attached to the bones, forming their endosteum. Its inner

surface is covered with pavement epithelium, and perhaps by the parietal layer of the arachnoid membrane, but this is denied by Kölliker. It is usually studded, except in infancy, by numerous small whitish masses called the Pacchionian bodies, whose use is not understood. The tentorium and the falces (*falx cerebri* and *falx cerebelli*) are induplications of the dura mater sent into the cavity of the skull. Within the spinal canal the dura mater becomes a fibrous tube, separated from the vertebræ (which have an endosteum) by a loose areolar fatty tissue and a plexus of veins. It is much larger than the spinal cord, the space between being filled by the other meninges and by the cerebro-spinal fluid.

Revised by WILLIAM PEPPER.

Dura'men [Lat., hardness, ligneous vine-branch, deriv. of *durus*, hard]: the heart-wood of ligneous plants. It is the inner and older wood, and is distinguished from the alburnum or sap-wood by its greater density and hardness, and usually by a darker color. The line of demarcation between the duramen and alburnum is usually not clearly marked. The proportion of alburnum to the entire trunk runs from 0·1 per cent. in chestnut to 0·4 in the Scotch fir. Of the remainder, the greater part is heart-wood. L. H. B.

Duran, doo-raan', AGUSTIN: scholar; b. in Madrid, Spain, Oct. 14, 1789; devoted himself first to legal studies, then turned to literature. In 1836 he became chief librarian of the Royal Library; in 1854 director of the same. He is chiefly known for his researches in the ballad-poetry of Spain. His *Romancero General*, or collection of all the Spanish ballads accessible in his time, long remained the best work of the kind in Europe (2 vols. in the Biblioteca de Autores Españoles, 1849–50). D. in Madrid, Dec. 1, 1862.

A. R. MARSH.

Durance (in Lat. *Druentia*): a river in the southeastern part of France; rises among the Cottian Alps in the department of Hautes-Alpes. Its general direction is nearly southwestward. It flows through the department of Basses-Alpes, forms the southwestern boundary of Vaucluse, and enters the Rhône 3 miles below Avignon. Its total length is nearly 200 miles. Marseilles is supplied with water from this river by an aqueduct 51 miles long.

Durand': city; capital of Pepin co., Wis. (for location of county, see map of Wisconsin, ref. 5–B); situated on railway and on Chippewa river; about 20 miles N. of Wabasha, Minn.; has churches of three denominations, high school, creamery, machine-shops, saw-mills, lumber-yard, etc. It is situated in an agricultural district, and has a very large trade in hogs. Pop. (1880) 642; (1890) 1,154; (1900) 1,458.

EDITOR OF "COURIER."

Durand, ALICE MARY CÉLESTE: See GREVILLE, HENRY.

Durand, ASHER BROWN: landscape-painter; b. at Jefferson, N. J., Aug. 21, 1796. He was an engraver until 1835, when he took up painting and went to Europe to study in 1840. One of the founders of the National Academy of Design in 1826, and its president from 1845 to 1861. D. at South Orange, N. J., Sept. 17, 1886. W. A. C.

Durand-Claye, dü'raăn'klā', ALFRED AUGUSTINE: civil engineer; chief engineer of Ponts et Chaussées; officer of the Academy; b. in Paris, July 18, 1841. After studies at St.-Barbe he entered the Polytechnic School, taking the highest rank on his examinations. He graduated also at the head of his class in 1862, and entered the École des Ponts et Chaussées. Appointed engineer in 1866 and attached to the service of the city of Paris, he was assigned by Belgrand to study the questions of the utilization of sewage and the purification of the Seine, a subject to which he devoted his whole life. He established the irrigation works in the Forest of St.-Germain and the plain of Gennevilliers, the first and most successful works on a large scale for the purification of sewage. An indefatigable worker, Durand-Claye was upon all the great commissions on public works. He was also professor at the École des Beaux-Arts and at the École des Ponts et Chaussées. His principal writings are upon sewage disposal, sewage irrigation, and the purification of the Seine. In 1867 he published in *Annales des Ponts et Chaussées* a remarkable theory of the stability of arches. D. Apr. 28, 1888. W. R. H.

Durand de Saint-Pourçain, dü'raăn'de-săn'poor'săn', GUILLAUME, known as the MOST RESOLUTE DOCTOR: a scholastic divine; b. at St.-Pourçain, Auvergne, about 1280. He was a Dominican friar in his youth. In 1318 he became Bishop of Le Puy-en-Velay (or Annecy), and in 1326 Bishop of Meaux. He was a decided nominalist, and by his independent thinking is believed to have contributed to the rise of the Reformation. His best-known writings are commentaries on Peter Lombard and a work on the canon law (*De Origine Jurisdictionum*). In his treatise *On the State of the Pious Dead* he attacked the opinions of Pope John XXII. D. at Meaux, Sept. 10, 1334.

Durando, doo-raan'dō, GIACOMO: general; b. at Mondovi, Italy, in 1807. He printed in 1847 a brochure in favor of Italian unity under a constitutional government, which had an extensive influence. He was Minister of War at Turin 1854–55; became a senator in 1860; was Minister of Foreign Affairs in the cabinet of Ratazzi 1862–63; and president of the senate 1884–87. D. in Rome, Aug. 26, 1894.

Durau'go: a state in the western part of Mexico; bounded N. by Chihuahua, E. by Coahuila and Zacatecas, S. by Jalisco, and W. by Sinaloa. Area, 42,530 sq. miles. The greater part of the state lies on the Mexican plateau. The Sierra Madre Mountains separate it from Sinaloa and occupy a considerable area in the W. In the S. E. there is a region of volcanic hills and lava-beds, occupying nearly 1,000 sq. miles and known as La Breña. The plateau is generally fertile, but is scantily watered, and portions in the N. and E. are deserts. Maize is the principal agricultural product, being extensively grown where the land is not too dry. A little wheat is raised, and sugar-cane and cotton are planted in some of the warmer valleys. The grazing industry is decreasing in importance; recent statistics for the state give 97,000 horned cattle, 31,000 horses, and 105,000 sheep. The mountains are well wooded and are rich in minerals, especially silver. There are rich iron-beds, as yet very little used. Durango corresponds nearly to the old intendency of Nueva Biscaya. Pop. (1895) 294,366. Capital, Durango.

HERBERT H. SMITH.

Durango, or **Victoria**: a city; capital of the state of Durango; in the southwestern part; about 30 miles E. of the Sierra Madre (see map of Mexico, ref. 5–F). It is situated in the extensive plain of San Antonio, on the little Rio del Tunel, at an elevation, according to Humboldt, of 6,847 feet. The celebrated Cerro del Mercado, near the city, is a hill about a mile long and 600 feet high, composed of iron ores (magnetic and hematite). Durango was founded by Alonso de Pacheco in 1563, and long marked the limits of civilization in Northern Mexico. At present it is reached by diligence from Zacatecas, on the Mexican Central Railway, a three-days journey. The city is an episcopal seat; has a large cathedral and many churches. The trade with the surrounding districts is considerable. The Durango mint was established in 1811, and up to 1888 had coined 63,000,000 pesos in gold and silver. There is a cotton-factory of some importance. The city is furnished with warm water from a large spring at the upper end. Pop. (1895) 42,165. HERBERT H. SMITH.

Durango: town; capital of La Plata co., Col. (for location of county, see map of Colorado, ref. 6–B); situated on Las Animas river and on the Denver and Rio Grande R. R.; 450 miles S. W. of Denver. It is in an agricultural, stock-raising, and mining region, and is an outfitting-point for miners. Pop. (1890) 2,726; (1900) 3,317.

Durant, HENRY FOWLE: philanthropist; b. at Hanover, N. H., Feb. 20, 1822; named originally Henry Welles Smith; graduated at Harvard in 1841; studied law with Benjamin F. Butler; changed his name; practiced in Boston with success and made profitable business investments; in 1863, on the death of his only son, determined to devote himself to the promotion of religion, and gave up his lucrative practice to become a lay preacher; founded WELLESLEY COLLEGE (*q. v.*). D. at Wellesley, Mass., Oct. 3, 1881.

Durante, doo-raan'tā, FRANCESCO: composer; b. in Naples, Italy, Mar. 15, 1684; studied music at Naples under Gaetano Greco and under Scarlatti, and in 1742 became director of the conservatory of Sta. Maria di Loreto at Naples. His compositions consist solely of church music, and are marked by loftiness and purity of style. D. in Naples, Aug. 13, 1755.

Durao, JOSÉ DA SANTA RITTA: See SANTA RITTA DURÃO.

Durazno: a central department of Uruguay; between the Rio Negro and its southern affluent, the Yi; bounded N. by the departments of Rio Negro and Tacuarembó, E. by Cerrolargo and Treinta y Tres, S. by Treinta y Tres, San José, and Florida, and W. by Rio Negro. Area, 5,526 sq. miles. The high hills called the Cuchilla Grande del Durazno cross the middle from E. to W., giving out many spurs on each

side. The country is well watered and fertile, generally prairie land, though there are some woods near the rivers Negro and Yi. Stock-raising is almost the only industry. Some of the largest and finest stock-farms of Urnguay are situated here, and in connection with them are extensive meat-drying establishments and some tanneries and soap-factories. Capital, Durazno, on the river Yi, connected with Montevideo by railway, and having about 2,000 inhabitants. Pop. of department, 26,000. HERBERT H. SMITH.

Durazzo, doo-raat'sō (Turkish *Drasch*; anc. *Epidamnus*, afterward *Dyrrhachium*): a fortified maritime town of European Turkey; in Albania; on the Adriatic; lat. 41° 18′ N., lon. 19° 28′ E. (see map of Turkey, ref. 3–B). It is the seat of a Roman Catholic archbishopric. It has a safe harbor and an active trade in grain, tobacco, and olive oil. The ancient *Epidamnus* was a populous city. The expulsion of its aristocrocy in 436 B. C. was the origin of the Peloponnesian war. It was captured by the Norman chief Robert Guiscard in 1082, and by the Venetians in 1205. Pop. 5,000.

Durban, dŭr-băn': the largest and chief commercial town and only port of the British colony of Natal, South Africa; on the north side of the bay of Port Natal; in lat. 29° 52′ S., lon. 31° 2′ E. (see map of Africa, ref. 9–G); founded in 1834 by the British Captain Gardner, who named it in honor of Sir Benjamin D'Urban, governor of the Cape; connected with the Boer republic by rail; has a number of fine buildings, 7 hotels, 3 banks, and 2 newspapers. Pop. (1866) 4,991; (1895) 39,000.

Dur'bin, JOHN PRICE, D. D.: Methodist preacher; b. in Bourbon co., Ky., in 1800; educated at Miami University and Cincinnati College; entered the ministry in 1819. He was president of Dickinson College, Carlisle, Pa., from 1834 till 1845. Having visited Europe and the Levant, he published *Observations in Europe, principally in France and Great Britain* (2 vols., New York, 1844), and *Observations in Egypt, Palestine, etc.* (2 vols., 1845). For many years he was missionary-secretary of the Methodist Episcopal Church (1850–72), displayed great administrative ability in its affairs, and gained a high reputation for eloquence. He contributed largely to periodicals, etc. D. in New York city, Oct. 17, 1876. See his *Life* by J. A. Roche (New York, 1879).

Dü'ren, or **Mark Düren** (anc. *Marcodurum*): a town of Rhenish Prussia; on the river Roer and on the Cologne and Aix-la-Chapelle Railway; 18 miles E. of Aix-la-Chapelle (see map of German Empire, ref. 5–C). It has a Roman Catholic gymnasium, a high school, a female high school, an asylum for the blind, several fine churches, and manufactures of woolen cloth, carpets, cotton goods, etc. It was besieged and taken by Charles V. in 1543. Charlemagne held diets here in 775 and 779 A. D. Pop. (1890) 21,702.

Dü'rer, ALBRECHT: painter and engraver; b. at Nuremberg, Germany, in 1471; son of a goldsmith. The day of his birth is uncertain, owing to the way in which it is inserted in his father's diary, but it was probably May 21. He was a pupil of Michael Wohlgemuth, with whom he studied and worked three years (1486–89). He afterward passed four years in travel, visiting various parts of Germany, and returned to Nuremberg in 1494. He visited Venice in 1505, and while there painted a picture for the Tedeschi, or guild of German merchants, which was probably *The Feast of the Rose Garlands*, now in the monastery of Strahow at Prague. This was his first picture of importance. In 1520 he went to the Netherlands, accompanied by his wife, and during his journey, the object of which is not known, he kept a minute diary, which was first published in Von Murr's *Journal zur Kunstgeschichte* (1775–88). This curious and interesting record of early travel has been several times translated into English. Dürer returned home in 1521, and continued to live in his native town until his death, Apr. 6, 1528. Dürer's works consist of paintings in oil and engravings on wood and copper. He has also left a number of etchings; and over 500 of his drawings in pen and ink, water-color, chalk, charcoal, india-ink, and with the silver point, exist in public and private collections. These drawings and sketches are remarkable for their precision, delicacy, and firmness of touch, and for the power of observation and patient study they reveal in the master. The finest collections are in the British Museum, the Albertina Gallery at Vienna, and the Uffizi at Florence. His most celebrated paintings are *The Four Apostles*, originally presented by him to the city of Nuremberg, but now in Munich; his own portrait in the Pinakothek at Munich, painted in 1500, and another—an earlier one—in the Uffizi Gallery at Florence, and an *Adoration of the Magi*, a most beautiful picture, well worthy of the place it occupies in the tribune. His best wood-cuts are the four series, *The Apocalypse*, *The Great Passion*, *The Little Passion*, and *The Life of the Virgin*, but there are many fine single cuts. Dürer is not believed to have engraved all the wood-cuts that bear his monogram, but only to have made the designs. Perhaps the works by which Dürer is most widely known are his engravings on copper. Of these the most famous are the *Adam and Eve*, the *Melencholia*, the *Knight, Death, and the Devil*, the *Saint Eustache*, *Saint Jerome in his Study*, and *The Great Fortune*. These are all large, but many among the smaller engravings are equal miracles of execution. Dürer was much beloved by the Emperor Maximilian I. and by many of the most distinguished men of his time—by Luther, by Melanchthon, by Erasmus, as well as Camerarius and Pirkheimer. When in Venice he received much kindness from Bellini, and Raphael and he exchanged specimens of their work. Dürer has left us valuable portraits of Melanchthon, Erasmus, Pirkheimer, and many other notables of his time. He was the author of several treatises—*Instruction in the Art of Mensuration with the Rule and Compass* (1525); *The Art of Fortification* (1527); with one on *The Proportions of the Human Body* (1528). A work on the *Proportions of the Horse* is lost, as is also one on *The Art of Fencing*, with perhaps some others whose names are not known. The most important works on Dürer are J. Heller, *Das Leben und die Werke A. Dürers* (1827–31)—only the second volume of this valuable work ever appeared; his *Life* by Thausing (Leipzig, 1876; Eng. trans. 1882), and by Mrs. Charles Heaton (London, 1869), with the *Albert Dürer, ses Dessins*, by Charles Ephrussi (Paris, 1882). An English translation of his writings is published by the Clarendon Press. His engravings on metal have been reproduced by Amand-Durand, of Paris, and his wood-cuts of his *Apocalypse* and *Life of the Virgin* by Van de Weiger, of Utrecht. A photo-lithographic reproduction of *The Little Passion* was issued by J. W. Bouton in 1868, and copies of his copper-plates by J. R. Osgood, of Boston, in 1872.

CLARENCE COOK.

Du'ress [O. Fr. *durece* : Ital. *durezza* : Span. *dureza* < Lat. *duri'tia*, hardness, deriv. of *durus*, hard]: in law, restraint of the person or of goods. 1. *Of the Person.*—This is exercised in two modes, either by threats or by imprisonment. Duress by threats (*per minas*), according to the older authorities, occurred where a person entered into a contract or performed some other act through fear of loss of life or limbs, or grievous bodily harm. It was even an excuse for some crimes, but not for those of the graver class, such as the killing of an innocent person. The modern cases do not take quite so technical a view of the subject, and the tendency is to make the presence of duress turn on positive inquiry whether the threat was of a kind calculated to overcome the will of a person of ordinary firmness and prudence. In equity jurisprudence the word is used in a broader sense than in the courts of common law, and includes cases where a party is in extreme necessity and distress; and duress may be exercised not only toward the person who makes a contract, but in certain cases toward one standing in confidential relations with him. Thus a threat to prosecute criminally a son, whereby a father is induced to execute a deed in order to save him from arrest, is sufficient duress in equity to furnish a basis to set the conveyance aside. A contract executed under duress is not void, but only voidable at the election of the injured party. Duress of imprisonment can be affirmed only of the case of unlawful restraint.

2. *Duress of Goods.*—This phrase refers to a case where a person having goods illegally detained pays money to obtain their release. If such payment is made under protest, the money may be recovered as being paid under compulsion. An instance is an exaction of unauthorized duties upon goods by the collector of a port. The mode of making the protest in this special case is regulated in the U. S. by act of Congress.

The question has been raised whether the doctrine of duress can be applied in international law to relieve a nation from the obligations of a treaty of peace. The answer must in general be in the negative, as the terms of peace, however humiliating, are the chances of war to which the parties have appealed.

T. W. DWIGHT.

Duret, dü'rā', Francisque Joseph: sculptor; b. in Paris, Oct. 19, 1804; studied with his father, with Bosio, and at Rome. His works, among them *Fisher-boy Dancing* (1833), *Vintager* (1839), and statues of Molière and Chateaubriand, are dignified compositions of great power and correctness, but somewhat lacking in originality and in vigor of conception. Perhaps his most famous work is a *Neapolitan Dancer*, exhibited five years after the *Fisher-boy*. Equally fine are two bronze statues at the tomb of Napoleon I. at the Church of the Invalides. D. in Paris, May 25, 1865.

D'Urfey, dŭr'fĕe, Thomas: dramatist of Huguenot ancestry; b. at Exeter, England, 1653; gained the favor of Charles II. He wrote successful comedies, among which were *The Fond Husband, or the Plotting Sisters* (1676), and *Sir Burnaby Whig, or No Wit like a Woman's* (1681); popular songs, published collectively in 1719-20 as *Wit and Mirth, or Pills to Purge Melancholy*; and odes. D. in London, Feb. 26, 1723.

Durgâ, or **Dourga**: a Sanskrit word signifying "difficult of access"; one of the many names of Pârvatî (*q. v.*).

Durham, dŭr'am: a county in the northern part of England; bounded N. by the river Tyne, E. by the German Ocean, and S. by the river Tees. Area, 1,012 sq. miles. The surface is hilly, but the greater part of the land is arable. The rocks which underlie it are new red sandstone, carboniferous limestone, and magnesian limestone. Among its mineral resources are coal, iron, lead, and marble. The collieries of Durham are the most extensive and valuable in England. The county produces a celebrated breed of shorthorned cattle. The chief towns are Durham, Sunderland, Darlington, South Shields, and Gateshead. Pop. (1901) 833,310.

Durham: an episcopal city of England; capital of the county of the same name: on the river Wear, 14 miles S. of Newcastle (see map of England, ref. 4–H). It is built around a steep rocky hill, the top of which is occupied by a castle and cathedral. It is connected by railways with Newcastle and other towns. It sends a member to Parliament. Here is a castle founded by William the Conqueror about 1072. The magnificent cathedral of Durham was founded in 1093, and is a Norman structure 507 feet long by 200 wide, with a central tower 214 feet high. The grand Norman church which Bishop Carileph built, and which is distinguished by its strength, the exquisite proportions in all its divisions, and the elaborate execution, still forms the main part of the whole construction. Many additions, however, have been made in the course of time; as, for instance, the Galilee or western chapel, from the Transition period, built by Bishop Pudsey between 1153 and 1195, the eastern transept, or the so-called Nine Altars, containing the remains of St. Cuthbert, etc. The city itself originated, indeed, from the cathedral. Though there was a small Roman camp at Maiden Castle Hill, close by, Durham itself dates only from the end of the tenth century. The cathedral contains the tombs of Saints Cuthbert and Bede. A college was instituted here by Cromwell, but was suppressed at the Restoration. The present university was opened in 1833. The colleges of medicine and of physical science at Newcastle-on-Tyne are affiliated with it. Durham also has seven parish churches, diocesan training-colleges, a grammar school, a school of art, a miners' hall, a town-hall, and a prison. At Ushaw, 4 miles to the W. of Durham, is a noted Roman Catholic college called St. Cuthbert's College. Pop. (1891) 14,863.

Durham: city and railway center; capital of Durham co., N. C. (for location of county, see map of North Carolina, ref. 2–G); 25 miles N. W. of Raleigh. It has many large factories producing smoking tobacco, cigarettes and snuff, tobacco-boxes, fertilizers using tobacco dust as a basis, and tobacco-bags. There are 11 churches, a seminary for young ladies, graded schools, 2 newspapers, and waterworks. The surrender of Gen. J. E. Johnston, of the Confederate army, took place near Durham, Apr. 25, 1865. The prosperity of the city dates from the close of the civil war. Pop. (1880) 2,041; (1890) 5,485; (1900) 6,679.

Editor of "Recorder."

Durham, John George Lambton, Earl of: statesman; b. in the county of Durham, England, Apr. 12, 1792. He was elected to Parliament by the Whigs in 1813, and was an advanced Liberal. He was created Baron Durham in 1828; became Lord Privy Seal in the cabinet of Earl Grey in Nov., 1830, and was one of the four persons who prepared the Reform bill of 1831, which he supported in the House of Lords. In 1833 he resigned the office of Lord Privy Seal and received the title of earl. He was sent as ambassador to Russia in 1835, and in 1838 was appointed Governor-General of Canada, then in rebellion, but returned suddenly in Dec., 1839, on account of the Government's disapproval of his measures. He submitted an important report on Canadian affairs, advocating liberal changes in the colonial government. D. in Cowes, Isle of Wight, July 28, 1840.

Durham Breed of Cattle: See Shorthorns.

Du'rian, or **Durion**: a tree (*Durio zibethinus*) of the family *Sterculiaceæ*, a native of the Malay peninsula, cultivated by the Malays for its delicious fruit, which forms a great part of their food. It is a lofty tree, with simple leaves and large clusters of pale-yellow flowers. The fruit is globular or oval, about 10 inches in diameter, and has a hard, thick, prickly rind inclosing a creamy pulp. Its ten to twenty seeds are eaten roasted. It combines the most delicious flavor with a very offensive odor.

Duris of Samos: Greek historian of the fourth century; disciple of Theophrastus; uncritical collector of historical and annalistic material; one of the sources of Diodorus and Plutarch. See Müller, *Fragmenta Historicorum Græcorum* (vol. ii., 466–88).

Durkheim, doork'hīm: town of Bavaria; on the Isenach; 20 miles N. of Landau (see map of German Empire, ref. 6–D). It has a castle, a hospital, manufactures of paper and glass, and an active trade in wine. It is surrounded by beautiful scenery, and is a resort of invalids. The neighboring salt-springs of Philippshall not only supply the bathing-establishment, but annually produce about 8,000 cwt. of salt. The city originated as a dependency of the Benedictine abbey of Limburg, came afterward into the possession of the Counts of Leiningen, and had its share of the military vicissitudes of the Palatinate. Pop. (1890) 6,081.

Durlach, door'laḵh: town of Baden; on railway and on the river Pfinz; 3 miles E. of Carlsruhe (see map of German Empire, ref. 6–D). It is at the base of the Thurmberg, a hill the top of which is occupied by a ruined castle. It manufactures linen, iron, sewing-machines, tobacco, beer, vinegar, and chicory. Before the foundation of Carlsruhe, in 1715, it was the residence of the Margraves of Baden and a prosperous place, though it was several times devastated by the French. Pop. (1890) 8,240.

Duroc, dü'rok', Gérard Christophe Michel: Duke of Friuli; general and diplomatist; b. at Pont-à-Mousson, France, Oct. 25, 1772. Destined for a military career, he early entered the military school of his native city, from which he was graduated in 1792 as sub-lieutenant of artillery. He became in 1796 aide-de-camp to Bonaparte, whom he accompanied to Egypt in 1798. During the consulate and the empire, he was sent on diplomatic missions to Berlin, Vienna, and other courts. He was a favorite officer of Napoleon, who made him general of division, governor of the Tuileries, and Duke of Friuli, and who received the news of his death with the greatest emotion. He was killed in the battle of Wurtzen, May 23, 1813.

Durra, **Dhurra**, or **Doora**, called also **Indian Millet**: a kind of grain (*Sorghum vulgare*) much cultivated in Asia, Africa, and Southern Europe. The genus differs from *Andropogon* in having hermaphrodite spikelets and glumes, with three small teeth at the end. The species are mostly tall, broad-leaved annual grasses, with large panicles, and strong culms containing a sweet and juicy pith. The durra (sometimes called jowaree in India) has grain somewhat larger than mustard-seed. It yields abundant crops, and the stalks and leaves are food for cattle and horses. The sugar-cane is also a variety of the same species. The Caffer corn (*Sorghum caffrorum*) is chiefly valued as food for horses. The durra grows well in the U. S., but has not been found profitable for culture.

Duruy, dü'rü-ee', Jean Victor: historian; b. in Paris, Sept. 11, 1811. He published many popular and excellent historical and geographical works, some of which were designed for schools. He was minister of public instruction from June, 1863, to July, 1869, and made important changes in the educational system of France. Author of *Histoire des Romains* (History of the Romans, 2 vols., 1843–44; 7 vols., 1870–79); *Histoire de France* (2 vols., 1852); and *Histoire de la Grèce ancienne* (History of Ancient Greece, 2 vols.,

1862), and a number of important works on historical geography. D. in Paris, Nov. 25, 1894.

Dur'yea, Joseph Tutnill, D. D.: clergyman; b. at Jamaica, Long Island, N. Y., Dec. 9, 1832; graduated in 1856 at the College of New Jersey, where he afterward taught Greek and rhetoric 1857–59; graduated at the Princeton Theological Seminary 1859; was pastor of the Second Presbyterian church, Troy, N. Y., 1859–62; associate pastor of the Collegiate Reformed Dutch church, New York, 1862–67; became pastor of the Classon Avenue Presbyterian church, Brooklyn, N. Y., in 1867, of Central Congregational church, Boston, Mass., in 1879, of the First Congregational church, Omaha, Neb., in 1889, and of the First Reformed church, Brooklyn, N. Y., in 1895. D. in Boston, Mass., May 17, 1898.

Düs'seldorf (i. e. Düssel-Town): town of Rhenish Prussia; the former capital of the duchy of Berg; finely situated on the right bank of the Rhine, at the mouth of the river Düssel; 17 miles N. N. W. of Cologne; lat. 51° 13′ N., lon. 6° 45′ E. (see map of German Empire, ref. 4–C). It is connected by railways with Cologne, Elberfeld, and other towns. The Rhine is here crossed by a bridge of boats. Düsseldorf is mostly built of brick, and has wide and regular streets. It has several fine churches, a fine public garden called the Hofgarten, a celebrated academy of art (see below), an old electoral palace, a gymnasium, a Realschule, a townhall, a public library, a theater, an observatory, and manufactures of woolen and cotton fabrics, jewelry, hats, leather, carpets, etc. Its prosperity is derived partly from trade and the navigation of the Rhine; it became a free port in 1829. Pop. (1900) 213,767.

The Düsseldorf Academy, founded in 1767 by Prince Charles Theodore, led a languishing life until, under the patronage of Frederick William III., Cornelius was appointed director, which position he continued to fill until his removal to Munich in 1826. A man of such ability and force naturally quickened the growth of art, and the academy soon became the center of a new life. On the departure of Cornelius, William von Schadow was made director, and his great skill as a teacher, added to his proficiency in his art, increased the reputation of the academy as a school, and drew to it more and more of the rising, undeveloped talent of Young Germany. The names that make this period in the history of German art, in the eyes of Germans at least, a modern Renaissance—Koch, Overbeck, Veit, Schnorr, Von Schwind—are most widely known by the frescoes with which they adorned so many palaces, villas, churches, and public buildings in Rome, Munich, and Berlin; but the artists of the Düsseldorf school have spread the name of their alma mater far and wide by means of their easel pictures. Their chief influence outside of Germany has been in the U. S., where many of their best works have been exhibited and sold. Several artists who were trained in Düsseldorf and returned to the U. S. to live aided in spreading the doctrines of the school through their own productions. In 1853 an exhibition of Düsseldorf pictures, belonging to Mr. Boker, was opened in the city of New York, and long continued one of the principal attractions of the town.

The school at Düsseldorf was early divided into two parties—the Roman Catholic and the Protestant, the former seeking to restore the ancient exclusive devotion of art, as in the Old Cologne school, to religious, chiefly Roman Catholic, subjects; the other, of which Lessing was the acknowledged head, refusing to be shut up in such narrow limits, and painting all subjects—landscape, genre, historical, and religious—having, however, a strong leaning to the Protestant side. The harm the Düsseldorf school has done is not perhaps greater than has been done by the schools of Berlin and Munich. It inculcates the fatal doctrines that art can be taught sufficiently by an academic process, and that its ministry is that of a preacher of doctrines or a narrator of anecdotes, religious, historical, domestic. It confounds art with science, and dissects where it ought to create. But in their own narrow, pedantic field here were men of sense, talent, learning, industry—everything but genius; the men of genius in Germany, as everywhere, have grown up and worked outside of all schools—and they have had the reward that always awaits the commonplace and the practical. They have been extremely popular, they have stimulated a great number of kindred minds, and they have more than supplied the demand for works of art that everybody can understand.

Dussieux, dü'si-ö', Louis Étienne: historian and geographer; b. in Lyons, France, Apr. 5, 1815; obtained the prizes of the Academy in 1839 and 1840, and became Professor of History and Geography in the School of St. Cyr 1842. D. 1894. Author of *L'art considéré comme symbole de l'état social* (1838); *Essai historique sur l'invasion des Hongrois en Europe et spécialement en France* (1839); *Recherches sur l'histoire de la peinture sur émail* (1840); *Géographie historique de la France, ou Histoire de la formation du territoire français* (1843, in thirty-three charts); *Cours de géographie physique et politique* (1846–48, with maps and notes); *Les Artistes français à l'étranger* (1852; 3d ed. 1875); *Force et faiblesse de la Russie au point de vue militaire* (1854); *Histoire de France racontée par les contemporains* (4 vols., 1860–62); *Cours classiques de géographie* (6 vols., 1859–65); *Les Lettres intimes de Henri IV.* (1876).

Dust: particles of matter so fine that they may be raised and wafted by the wind. The recent discoveries of science have shown that dust plays an important part in the spreading of infectious diseases, and in the occurrence of many cosmic, meteorological, physical, and geological phenomena. In meteorology it is important for the fine colored effects it produces in the sky. These were well illustrated in the brilliant twilights, green sun, bishop's ring, and other phenomena which followed the Krakatoa eruption in Aug., 1883. These phenomena are due to the diffractive effects of minute bodies. A study of the phenomena showed that the minutest particles, which were thrown the highest, traveled on a high west-bound current of air whose existence had hardly been suspected before. They also showed that these extremely minute particles fell through the air with such slowness that they were months, possibly years, in descending.

The relation of dust to the condensation of moisture in the air has been especially studied by a Scotch physicist named Aitken. He believes that he has shown that the moisture in the air condenses to form the particles of fog, rain, and snow, only where there are particles of dust present to form a nucleus. His theory is that moisture condenses with difficulty unless there is a free surface or particle of matter for it to condense upon as a nucleus, and that the particles of dew, fog, rain, snow, and hail are formed by condensation upon the dust on the surface of the earth or particles of solid matter suspended in the atmosphere, as the case may be. This theory is not yet universally accepted, though all competent judges admit that condensation is easier on free surfaces.

The dusts at the earth's surface consist of comminuted earth and rock, particles of fibers and fragments of vegetable tissue, smoke, and to a greater or less degree of living organisms and spores. The last play an important part in disease, the nature and extent of which we are just beginning to understand.

Many of the showers noted as extraordinary, such as showers of sulphur, blood, etc., are due to dusts of various sorts which mingle with the rain.

The electric reactions of dust are also remarkable. A piece of rosin rubbed will attract or repel dust, and it is said that the fumes produced in some forms of manufacturing can be expelled by electric action. See Afterglows and Loess.

Cosmic Dust consists of the ashes of meteorites. The smaller meteors usually undergo complete combustion in the air because of the heat generated by their rapid motion. It is possible that some of the results or remains of combustion reach the earth's surface. Nordenskiold in 1870 found on the inland ice of Greenland tear-shaped grains of magnetic iron with cobalt, which he attributes to a cosmic origin. There is a high degree of probability in this hypothesis, as volcanic dusts are not of this character, and dusts of other origin are improbable on this ancient ice-sheet. He has since found dust of similar character on Spitzbergen (1872), in Finland (1872), and in heavy snows at Stockholm. See Nordenskiold, *Voyage of the Vega* (1886).

Mark W. Harrington.

Dust-brand: See Smuts.

Dus'tin, Hannah: wife of Thomas Dustin, of Haverhill, Mass.; was married Dec. 3, 1677, and became the mother of thirteen children. She was taken prisoner by the Indians in the attack on Haverhill, Mar. 15, 1698, her nurse and infant one week old being also taken, but the child was soon after killed. She was placed in an Indian family of eleven persons on an island (now called Dustin's island) in the Merrimack river, near the mouth of the Contoocook, in New Hampshire, but with the aid of the nurse and a white captive boy she killed all the Indians in their sleep,

except a squaw and a boy who escaped. She returned to Haverhill with their scalps.

Dutch East India Company: See East India Company.

Dutch Gap Canal: a cut through the narrow isthmus of a peninsula known as Farrar's island, in the James river, about 5 miles below Richmond, Va.; made during the civil war; designed to afford the national vessels a nearer approach to the Confederate works, to avoid the great obstructions which had been placed in the curve of the river, and to outflank the heavy Howlett House batteries. It was executed under Maj. P. S. Michie, by order of Gen. B. F. Butler. The work was undertaken Aug. 15, 1864, and finished Jan. 1, 1865; but a large part of the bulkhead of clay which was blown out by powder on that occasion fell back, so as to obstruct navigation for the time. It was of no service to either side during the war, but has since shortened the navigation of the river to Richmond some 7 miles.

Dutch Gold: an alloy of copper and zinc, closely resembling common brass, but having rather less zinc in its composition than brass generally has. It is used for beating into thin plates, resembling gold-leaf in appearance when new, and is used for ornamentation instead of gold-leaf. It tarnishes readily, and may be tested by the application of strong nitric acid, which will not injure gold-leaf, but readily dissolves the imitation.

Dutch Guiana: See Guiana.

Dutch Language: that spoken by the inhabitants of the Netherlands. In its earlier as well as in its present form Dutch or Hollandish is, with some slight differences, identical with the Flemish (*q. v.*), the language of the Low German inhabitants of Belgium. Dutch is furthermore spoken in the East and West Indian colonies of the Netherlands, in the South African Republic, in the Orange Free State, and to some extent in the English Cape Colony.

The Term Dutch.—In the Middle Ages this language was called *Dietsch*, i. e. the popular, vernacular language, especially in distinction from Latin and from the Romance languages. In the well-known poem *Van den vos Reinaerde* (vs. 1461, *seq.*), when Reinaert begins to make his confession in Latin, Grimbert answers to him: *Ôm, walschedi? Of ghi iet wilt, sprîct jeghen mi in Dietsche, dat ict mach verstaen* (i. e. Do you speak in a foreign tongue, uncle? Talk Dutch to me, if you please, so that I may understand it). In a similar way *Walsch* and *Dietsch* are often contrasted. Besides *Dietsch*, the spelling *Duutsch*, or later on *Duitsch*, is found. As concerns its etymology, this term is of course identical with *Deutsch*, the name given by the Germans to their language. Its origin may be traced back to an early date in the history of the Teutonic languages. In the Gothic translation of the Bible by Vulfila, dating from the fourth century, we find (Gal. ii. 14) the adverb *þiudiskō* translating the Greek *ἐθνικῶς*. The meaning is heathen; but the word is derived from *þiuda*, people, in the same way as Greek *ἐθνικός* from *ἔθνος*, or Latin *gentilis*, heathen, from *gens* (genit. *genti-s*), and the more literal and more original meaning of the adjective *þiudisks* is popular, found with the people. The same adjective occurs in Anglo-Saxon in the form *þéodisc*. It is used as a noun, meaning language, nation. In Old High German the original form *þiudisc* has changed, according to Grimm's law, to *diutisc*. While *diot* in O. H. G. is simply people, *diutisc* is only applied to the popular or vernacular (i. e. German) idiom, as distinguished from the learned language and the language of the Church (i. e. Latin). The term was then adopted by the Frankish authors of the ninth century in their writings in Latin, and in its Latinized form *Theodiscus* (or sometimes *Diutiscus*) is found even more frequently than in O. H. G. texts. *Lingua Theodisca* is used parallel with expressions like *sermo vulgaris*, *barbarus*, *rusticus*, *patrius*, and *Theodisce*, instead of *vulgo*, *rustice*. In Mediæval Latin *Theodiscus* yielded in the tenth and the following centuries to the more learned form *Teutonicus*. The revival of classical Latin by the "humanists" has led, since the sixteenth century, to the replacing of *Teutonicus* by the more correct forms *Germanicus* and *Germanus*. Meanwhile the adjective *thiudisc*, or *diutisc*, retained its place outside of Latin in the language of Germany and the Netherlands, and is still the regular designation of the vernacular language, only having undergone the regular phonetic changes to which the divergence of Modern German and Modern Dutch from the older stages of the language is mainly due. Old High German *diutisc* became Middle High German *diutsch* (pronounced *dŭtsch*) and Modern German *deutsch*. In Middle Low German we find *dudesch*. This form would seem to contain in its first syllable a long *u*. But as in Modern Low German the adjective is *dŭtsch*, which presupposes Middle Low German *dŭdesch* and can not be derived from *dūdesch*, it is more probable that *dudesch* was pronounced *dŭdesch*, the modified vowel, as in other cases, not having been marked in writing. In the Modern Low German dialect of Westphalia and Waldeck *ŭ* is pronounced *°ŭ* or *ᵘŭ* (by others spelled *uĭ*), and with this or a similar pronunciation is to be identified the Middle Dutch spelling *duutsch* and its modern successor *duitsch*. The old variation *dietsch* is either simply a different spelling of the form just mentioned, or it belongs to a different dialect, in which the original *iu* was (like original *io*) changed to *ie*.

Dutch Dialects.—The history of the Dutch language—like that of most written languages—can not be thoroughly understood without regard to its connection with the Dutch dialects. There are three quite distinct sets of dialects found among the Germanic inhabitants of the Netherlands and Belgium, which extend as far back as our sources go—Frisian, Saxon, and Frankish.

(1) *Frisian* was originally in geographical area the chief dialect, but has gradually retrograded before the two other dialects. In the earliest times Frisian tribes occupied the whole north and west of the Netherlands, from the mouth of the Ems down beyond the mouth of the Schelde, viz., the provinces Groningen, Friesland, Drenthe, Over Ijssel, North Holland, South Holland, Zealand, and (W. of the Leije and Schelde) East and West Flanders. But as early as in the ninth century we find part of this territory occupied by Frankish and Saxon dialects. In the twelfth century pure Frisian was confined to Friesland, the northern part of North Holland, and the northern part of West Flanders (along the seacoast and in the "Vrije van Brugge"). A mixture of Frisian and Saxon was then spoken in Groningen, Western Drenthe and Western Over Ijssel, and in the southeast corner of North Holland. A mixture of Frisian and Frankish was found in the southern part of North Holland (the Naardingeland of Gooiland), in South Holland, Zealand, and in the greater part of East and West Flanders. At present Frisian is heard only in the province of Friesland (with the exception of the towns and a small area of the country, where Dutch has replaced it) and on the islands Schiermonnikoog and Ter Schelling. Traces of Frisian are preserved in the Frankish dialect of the eastern part of North Holland and in the Saxon dialects of Groningen (especially the "Westerkwartier," where the dialect is half Frisian).

(2) *Saxon* formerly occupied a much smaller area than Frisian, but has spread over former Frisian territory. It was at first confined to the southeast part of Groningen and the eastern parts of Drenthe, Over Ijssel, and Gelderland. At present the Saxon dialect is found in almost the whole of the provinces Groningen, Drenthe, and Over Ijssel, and in the county of Zutphen belonging to the province of Gelderland; but a difference is still noticeable in the dialect of the original Saxon territory and that of those localities which have adopted the Saxon instead of their former Frisian language.

(3) *Frankish* held and still holds the remainder of the Netherlands and of Belgium. It had its original seat in Limburg, Antwerp, South and North Brabant, East and West Flanders (excepting the parts of these provinces which have been mentioned under Frisian), Utrecht, and Gelderland (excepting the county of Zutphen). Like Saxon, it has expanded at the expense of Frisian, displacing the dialects along the western coast of the Netherlands and Belgium, where originally Frisian and later on a mixture of Frisian and Frankish was spoken, viz., the provinces North and South Holland, Zealand, and the northwestern parts of East and West Flanders. The Frankish dialects of the Netherlands and Belgium may at present be subdivided into (1) North Hollandish, (2) the dialect of South Holland, Utrecht, and West Gelderland, (3) Brabantish, (4) East Flemish, (5) West Flemish, (6) Zealandish, (7) Limburgish. All of these belong to the Low German division of Frankish, while the Frankish dialects of Germany (save a small area near the Dutch territory) constitute Middle Frankish and the High Frankish. The difference between the three divisions may briefly be indicated by stating that High Frankish has gone through the second shifting of consonants, whereas Low Frankish (like Low Saxon) has not been affected by the second shifting, and Middle Frankish takes an intermediate position between High and Low Frankish.

The Literary Language.—While in the development of the popular dialects both Frankish and Saxon have gained at the expense of Frisian, the written language manifests a distinct and early preponderance of the Frankish over the Saxon as well as the Frisian dialects. The latter can scarcely be said to have ever been literary languages. Official documents, laws, treaties, contracts, deeds were drawn up during the Middle Ages in Frisian and Saxon. But even in this limited use of an official language they were at first superseded by the Saxon of Northern Germany, and in the seventeenth century by the written language of the Low Frankish tribes. Traces of the Frisian and Saxon dialects are still found in the vocabulary of Modern Dutch about to the same extent as traces of Low German are found in Modern German. On the whole, these dialects have probably exerted less influence on Modern Dutch than the written language of France and Germany. The appearance of the written language has in course of time considerably changed. Its development may be divided into three periods (corresponding to the division of Low German into Old Low German, Middle Low German, and Modern Low German).

(1) *Old Dutch* (from the earliest times until about the end of the eleventh century).—It goes back to a time when the difference in spelling, pronunciation and inflexion between Dutch and German was not quite so distinct as it became later on. The most noteworthy monument of Old Dutch or Old Low Frankish is an interlinear version of the Psalter, dating probably from the tenth century, but only preserved (in a very fragmentary condition) in copies of the sixteenth and seventeenth centuries. The language of the Psalter represents, on the whole, an older form of Middle Dutch, although its dialect does not entirely coincide with what we may suppose to have been the original form of the latter.

(2) *Middle Dutch* (from the twelfth century until about about 1550).—The difference between Middle Dutch and Old Dutch is especially noticeable in the inflexional endings, where the various full vowels of the older language have given way to a monotonous *e*. Other changes have taken place in the stem-vowels, consonants, and inflexions. It is noteworthy that these changes sometimes agree with the changes which Low German and High German underwent at about the same time (e. g. the *e* of final syllables or *d* instead of older *th*), while in other cases they are peculiar to Dutch, or only shared by special German dialects (e. g. *cht* instead of older *ft*, or *ud* for older *ld*). The earliest author in Middle Dutch that we know of is Heinrik van Veldeke, who, in the latter half of the twelfth century, wrote his poems in the Limburgish dialect of Maastricht. As Limburg is near the German frontier and its dialect inclines toward Middle Frankish, it is natural that Veldeke's language differs to some extent from the general type of Middle Dutch. It is not before the thirteenth century that this type took a definite and lasting form, which is especially represented by the works of the well-known Flemish author Jacob van Maerlant (1235–1300). The language found in the works of Maerlant and his followers is the one which is called "Dietsch." It is a literary language of a distinct South Low Frankish character. It was based upon the dialect of Flanders, but admitted from the beginning words from the closely related dialects of Brabant, Limburg, Zealand. Later on it was subjected to the influence of German, French, and the Northern Low Frankish dialects. Still its character remained about the same until 1450, when a period of transition to Modern Dutch ensued.

(3) *Modern Dutch* (from about 1550 to the present time).—Modern Dutch differs less from Middle Dutch than e. g. Modern German from Middle High German. Its relation to Middle Dutch finds rather a more exact parallel in that of Modern German to Luther's language. At least in spelling, phonetics, and inflexion the difference is not greater than that between Modern German and Early Modern German. More considerable are the changes which the vocabulary has undergone. The reason for this is that while there is a break between the literary tradition in Middle High German and Modern German, in that the literary language in Modern German started with a dialect different from that upon which the literary language in Middle High German was based, Middle Dutch and Modern Dutch may be said to represent one and the same dialect. The literary language which originated in the southern provinces was gradually adopted by the writers of the northern provinces after these had been drawn into the literary movement and had become interested in literary culture. It is from the middle of the sixteenth century that in the literary language the supremacy of the southern provinces declines, the influence of the northern provinces gradually becoming predominant. This change coincides with the opposition of many authors (southern as well as northern) to the great number of foreign, chiefly French, words which had been introduced into the Middle Dutch language especially during the period of transition (with the government of the Dukes of Burgundy), and with a general attempt at purifying the language and revising its spelling, vocabulary, and syntax. The shifting of the center of literature from the south to the north was also aided by the separation of the southern from the northern provinces after the conquest of Antwerp by Parma in 1585. While during the sixteenth century Frisian and Saxon were still used—besides Low Frankish—in official documents, in the course of the seventeenth century the latter obtained the supremacy over the whole of Northern Holland. Another noteworthy fact in the history of the Dutch language of the seventeenth century is the publication, under the authorization of the States-General, of the so-called *Statenbijbel*, i. e. the translation of the Bible begun in 1619 and finished in 1637. This translation has contributed much to settling the spelling and inflexion of the literary language, and to strengthening its position. On the whole, the history of Modern Dutch is remarkably similar to that of Modern German. In the sixteenth century the literary language predominant, but still struggling with dialects which attempt to gain literary influence; at the end of the sixteenth century, and especially during the seventeenth, the formation of learned societies whose members are interested on the one hand in poetry and literary production, on the other hand in grammar, spelling reform, and in purifying the literary language; in the eighteenth, systematic and often arbitrary and hair-splitting rules, dictated by grammatical authorities for so-called logical and practical reasons, but without any knowledge of historical grammar; in recent times (from about the middle of this century), a steady emancipation of the language from the fetters which are due to the narrowness of former grammarians and the application of the results of modern historical grammar. The comparison may be carried up to the most recent times, when in the Netherlands as well as in Germany a new spelling has been introduced. In the Netherlands the spelling reform is especially connected with the names of L. A. te Winkel (d. 1868) and M. de Vries, the two chief editors of the great *Woordenboek der Nederlandsche Taal*, who proposed the present orthography in 1863 (or in its final form in 1865). Their proposals met with general approval on the part of the public, and were adopted by the Belgian Government as early as 1864, and finally by the Dutch Government in 1883.

Literary References.—(*a*) *General.*—For the etymology and history of the terms *Dutch*, *Deutsch*, etc., comp. J. Grimm, *Deutsche Gramm.*, i., 3d ed. (1840), pp. 10–20; *Excurs über Germanisch und Deutsch*; and E. Verwijs in *Taalk. Bijdr.*, i. (1877), pp. 217–232. For a general introduction to the Dutch language, see J. B. Vinckers and J. H. Gallée, art. *Holland.—Language* in the 9th ed. of the *Encyclopædia Britannica*; Jan te Winkel, *Geschichte der Niederländ. Sprache* in Paul's *Grundriss der german. Philologie*, i. (1891), pp. 634–722. Important essays on various matters connected with the Dutch language and its history are contained in several Dutch periodicals, especially *De Taalgids* (Utrecht, 1859–67); *De Taal en Letterbode* (Haarlem, 1870–76); *Taalkundige Bijdragen* (Haarlem, 1877–79); *Noord en Zuid* (Kulenborg, since 1876); and *Tijdschrift voor Nederl. Taal en Letterkunde* (Leyden, since 1881).

(*b*) *Dialects.*—On the modern dialects of the Netherlands, see especially J. Winkler, *Algemeen Nederduitsch en Friesch Dialecticon* (The Hague, 1874), and H. Jellinghaus, *Die Niederländ. Mundarten* (Norden and Leipzig, 1892). Comp. also the references in Paul's *Grundriss*, vol. i., p. 971, *sqq.* A special periodical on Dutch dialects is *Onze Volkstaal*, ed. by T. H. de Beer (1882, *sqq.*). Specimens of the different dialects are found in Winkler's work, in the third volume of Firmenich's *Germaniens Völkerstimmen* (Berlin, 1856), and in Leopold's *Van de Schelde tot de Weichsel* (Groningen, 1882). For a study of the Frankish dialect in general, comp. Braune in Paul and Braune's *Beiträge*, vol. i., page 1 ff., and Heinzel's *Geschichte der Niederfränk Geschäftssprache* (Paderborn, 1874).

(*c*) *Old Dutch.*—The remnants of the Old Low Frankish Psalms are easily accessible in Heyne's *Kleinere Altniederdeutsche Denkmäler* (2d ed. Paderborn, 1877). On the dia-

lect, see P. J. Cosijn, *De oudnederlandsche Psalmen* (Haarlem, 1873).

(*d*) *Middle Dutch.*—There are two recent grammars of Middle Dutch—J. Franck, *Mittelniederländische Grammatik* (Leipzig, 1883), and W. L. van Helten, *Middelnederlandsche Spraakkunst* (Groningen, 1886). A *Middelnederlandsch Woordenboek* is being published by J. Verdam and Verwijs (The Hague, 1882, *sqq.*). Volumes i. and ii., containing the letters A–G, have appeared; for the rest of the alphabet the glossaries of Middle Dutch texts have to be consulted. Comp. L. D. Petit, *Bibliographie der Middelnederl. Taal en Letterkunde* (Leyden, 1888).

(*e*) *Modern Dutch.*—Grammars of the current speech by Dutchmen are, e. g. H. Kern, *Handleiding tot het Onderwijs der Nederl. Taal* (6th ed. Amsterdam, 1883); P. J. Cosijn, *Nederl. Spraakkunst* (7th ed. Haarlem, 1886); W. L. van Helten, *Kleine Nederl. Spraakkunst* (5th ed. Groningen, 1885). The present spelling is based upon L. A. te Winkel, *De Grondbeginselen der Nederl. Spelling* (4th ed. Leyden, 1879), and M. de Vries and L. A. te Winkel, *Woordenlijst voor de Spelling der Nederl. Taal* (3d ed. Leyden, 1881). The representative Dutch dictionary is the *Woordenboek der Nederlandsche Taal*, begun in 1864 by M. de Vries and L. A. te Winkel and modeled after Grimm's *Deutsches Wörterbuch*. After Te Winkel's death in 1868 the work has been continued by De Vries in co-operation with several Dutch scholars (Verwijs, Cosijn, Kluyver, and others). An *Etymologisch Woordenboek der Nederl. Taal*, by Joh. Franck, begun in 1884, was finished in 1892. A phonetic analysis of the Dutch sounds (according to M. Bell's system) is given in H. Sweet's *Handbook of Phonetics* (Oxford, 1877). There are elementary Dutch grammars for English-speaking people, e. g. those of F. Ahn (new ed. London, 1887); J. M. Hoogvliet (new ed. The Hague, 1889); A. L. Snell (London, 1885); also dictionaries of Dutch and English, e. g. those of D. Bomhoff (new ed. Arnhem, 1877); and F. M. and N. S. Calish (new ed. Leyden, 1890).

HERMANN COLLITZ.

Dutch Literature: literature in the language of the people of the Netherlands. It may be said to have had its beginning about the middle of the thirteenth century, though a few fragments dating from the eighth century and written in Old Dutch are still extant, and translations of the *Chanson de Roland* and other French romances had been made as early as the end of the twelfth century. About 1250, however, appeared a Dutch version, probably by Willem the Minstrel, of the epic *Reynard the Fox*, written originally in Latin by Flemish priests, and regarded as one of the finest and most spirited productions of the Dutch literary genius. It became very widely known and popular, especially by means of a Low German version, *Reineke der Vos*, which was published in Lübeek in 1498. Willem the Minstrel's work was followed (about 1260) by translations of several of the Arthurian legends, of which those dealing with Merlin and the Holy Grail were rendered into Dutch by the famous Jakob van Maerlant (1235–1300), the so-called father of Dutch poetry. Van Maerlant, indeed, was the founder of a new school of writers, who protested against the works of the legendary poets and romance writers of the day, and devoted themselves to ethics, religion, history, and natural science. He left the domains of Arthurian legend and romances of chivalry (*ridderromans*) for lyric and didactic poetry, and it is in these fields that his best work was done. Among his didactic works may be mentioned *Der Naturen Bloeme* (Flowers of Nature), a treatise on natural history in thirteen books, containing many moral reflections and satirical observations on the society of his time, and his masterpiece, *Spiegel Historiael* (Mirror of History). Of his lyric poems *Wapene Martijn*, *Der Kerken Clage*, and *Van den Lande van Oversee* are specimens.

Among the immediate successors, imitators, and disciples of Van Maerlant may be mentioned Melis Stoke, who wrote the history of the state of Holland (*Rijmkronik*) down to the year 1305, a work which for its accuracy and fullness of detail has been of great service to subsequent writers; Jan Boendale, the author of a rhymed chronicle, the *Brabantsche Yeesten* in 1315; and Jan de Weert, a satirical and ethical writer.

A new chapter in the history of Dutch literature begins with the institution of literary guilds called *chambers of rhetoric*. These guilds had their origin in theatrical companies, *Gesellen van den Spele*, formed to represent the various *mystery* and *miracle plays* or religious dramas of that time. The earliest of these literary guilds dates from the end of the fourteenth century, and they continued to flourish during the fifteenth and sixteenth centuries. They were wholly mediæval in character, fashioned on the model of the craft guilds, and consequently opposed to aristocratic tendencies. Hardly a town of importance in the Low Countries was without one of these guilds, whose wealth and power became considerable, and whose splendid tournaments (*landjuweelen*), at which prizes for literary skill were awarded, were occasions of great social importance. But the influence of the guilds was not favorable to genuine literary taste or to poetic feeling and expression.

To the later period of the history of these chambers belong the names of two prominent writers, Hendrik Laurenszoon Spieghel and Roemer Visscher, who were connected with the Amsterdam guild called *De Eglentier* (The Eglantine), the chief of the chambers in Holland. Another eminent author of that time, but not connected with the chambers, is Dirck Volkertsz Coornhert (1522–90), the first to expound the principles of humanism in the Dutch language. He translated the *De Officiis* of Cicero and the *De Beneficiis* of Seneca, wrote plays, poems, and controversial works, and finally produced as his masterpiece the *Zedekunst* (Art of Ethics), a philosophical treatise in which he strove to set an example of pure and graceful style. The period that followed was the most brilliant in the history of Dutch letters. Among the noted writers were Jacob Cats (1577–1660), Pieter Cornelissen Hooft (1581–1647), Constantijn Huygens (1596–1687), and, greatest of all, Joost van Vondel (1587–1679).

JACOB CATS (*q. v.*), or *Vader Cats* (Father Cats) as he is affectionately called, was the writer of several long poems, whose simple, homely style, excellent moral tone, and shrewd common sense have made them wonderfully popular with the middle classes.

Hooft excelled in the writing of tragedy and of history. In the latter department he took Tacitus as his model. Motley speaks of him as one of the greatest historians of Europe. He was a severe purist in style, striving to rid the language of foreign and bastard words; but, on the other hand, he introduced many Latinisms of style and construction.

Of Huygens it is said that "while he had but little of the sweetness of Hooft or of the sublimity of Vondel, yet his genius was eminently bright and vivacious, and he was a consummate artist in metrical form. The Dutch language has never proved so light and supple in any hands as in his, and he attempted no class of writing, whether in prose or verse, that he did not adorn by his delicate taste and sound judgment."

Van Vondel is the greatest name in the history of Dutch literature. He excelled in the loftiest species of poetry, lyric, satire, and tragedy. His masterpieces are *Gijsbreght van Aemstel* and *Lucifer*, which, like his other tragedies, are lyric and plastic rather than dramatic. *Lucifer* was published in 1654, many years before Milton wrote the work treating a somewhat similar theme, the immortal *Paradise Lost*, and it is thought by some to be not improbable that Milton derived his material from the work of Vondel. This brilliant period in the history of Dutch literature came to an end about 1680, when a long interval of literary decline began, lasting until the closing years of the eighteenth century.

Among the more noted names of this period are Huibert Cornelissen Poot (1689–1733), a pastoral poet, who sang in emotional and melodious verse the praises of country as opposed to city life; Justus Van Effen, who was strongly influenced by the writings of Addison, Swift, and Defoe, and published the *Hollandsche Spectator* (1731–35); and Jacobus Bellamy (1757–1786), the author of *Roosje*, one of the most tender and touching ballads in Dutch or in any other language, and of many odes much admired in their day.

With Willem Bilderdijk (1756–1831) appeared the revival of letters which characterized the end of the eighteenth century. Bilderdijk's greatest works, however, were produced late in life, and have given him the foremost place in the Dutch literature of the nineteenth century. Of wonderful productive activity, he was distinguished in almost every department of letters. One of his best-known works is *De Ziekte der geleerden* (1806) (The Disease of the Learned), a didactic poem. His most ambitious work was an unfinished epic, *De ondergang der eerste waereld* (1820) (The Destruction of the First World).

Other modern poets of note are Hendrik Tollens (1780–

1856), author of the national hymn, *Wien Neerlandsch bloed*, and of many lyrical romances and popular ballads; Isaac Da Costa (1798–1860), the friend and disciple of Bilderdijk, and regarded as the most eminent poet in Holland after the latter's death in 1831; J. J. L. Ten Kate (b. 1819), author of *Bladeren en Bloemen* (1839) and the popular poem *The Creation* (1866); and P. A. De Genestet (1829–61), a poet of unusual promise.

Among prominent writers of serious prose may be mentioned Jan Hendrik Van der Palm (1763–1840), the famous Orientalist; Joannes Clarisse (1770–1846), J. J. Van Oosterzee (1817–1882), theologians; J. R. Thorbecke (1798–1872) and G. Groen Van Prinsterer (1801–1876), historians.

Among the best prose-writers in lighter vein and fiction are Jacob Van Lennep (1802–68), whose masterpiece, *Ferdinand Huyck*, is a most charming novel; Anna Louisa Geertruida Toussaint (1812–86), whose masterpiece is *Het Huis Lauernesse*; Nicholas Beets (1814), whose *Camera Obscura* is unsurpassed by anything in English for character-drawing, humor, and pathos; Van Koetsveld (b. 1807), who wrote *Schetsen uit de Pastorie te Mastland*; and J. P. Hasebroek, author of an excellent series of essays called *Truth and Dreams*.

In conclusion, attention may be called to the fact that Dutch literature has suffered perhaps most of all from the fact that Holland's greatest scholars and foremost literary men did not write in Dutch, but in Latin. Witness only the names of Erasmus, Hugo Grotius, and Spinoza.

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A. H. Huizinga.

Dutch Liquid, or **Ethylene Chloride** [called Dutch liquid because it was discovered by Dutch chemists in 1785]: a combination of ethylene (olefiant gas, C_2H_4) with chlorine; formula, $C_2H_4Cl_2$. It is a thin, inflammable, colorless liquid, of an agreeable fragrance and pleasant taste, somewhat resembling chloroform. Like chloroform, it has great anæsthetic powers when its vapor is inhaled, but the medical profession are not satisfied of its safety.

Revised by Ira Remsen.

Dutch Reformed Church: See Reformed Church of America.

Dutch South and East and **Dutch West Borneo**: See Borneo.

Dutch West India Company: an association formed in the Netherlands in 1621 for the purpose of trading with America and Africa, establishing colonies, and fitting out privateers against the Spanish and Portuguese. The capital was eventually 18,000,000 florins. It was composed of a union of five chambers, representing respectively the cities of Amsterdam, Zeeland, Rotterdam, Groningen, and the district of the north; these nominated nineteen directors who formed the central body of administration. The company received from the state 200,000 florins yearly for five years, a monopoly of trade with Africa and America, the right of constructing forts, raising fleets and armies, and making treaties; troops were to be furnished by the state but paid by the company; and in case of war the state agreed to lend a fleet. One of the first acts was to send a large fleet to Brazil, where Bahia was taken (1624) but soon abandoned; later, Pernambuco was seized, and became the center of extensive Dutch colonies in that part of Brazil. New Amsterdam (New York), already founded, was strengthened; powerful colonies were established in the West Indies and Guiana, and for half a century the fleets of the company ravaged the shores of Spanish and Portuguese America, taking cities, destroying ships, and gathering an immense amount of booty. The continual wars with Spain, Portugal, and England eventually proved the ruin of the company. Brazil was given up in 1654, and New York in 1667. In 1674 the company was forced to dissolve. A new one was formed in 1675, and held together until 1791, but it was never very prosperous. Of all the conquests of the West India Company the Netherlands now retain only Dutch Guiana, Curaçao, Saba, St. Martin, a few smaller islands in the West Indies, and the fort of St. George at Elmina on the Gold Coast of Africa. Herbert H. Smith.

Dutch White: See Baryta.

Dutens, Louis, F. R. S.: author; b. at Tours, France, Jan. 15, 1730; removed to England, where he obtained from the Duke of Northumberland the lucrative living of Elsdon; acted at three different times as English *chargé d'affaires* at Turin. Among his works are *Recherches sur l'origine des découvertes attribuées aux modernes* (1760); numismatical treatises, and *Mémoires d'un Voyageur qui se repose* (Paris, 1806). D. in London, May 23, 1812.—His nephew, Joseph Michel Dutens (b. at Tours, Oct. 15, 1765; d. Aug. 6, 1848), political economist, published *Philosophie de l'économie politique* (2 vols., Paris, 1835).

Dutertre, Jean Baptiste: French Dominican missionary and historian; b. at Calais, 1610. He served in the Dutch fleet, then entered the army, and was present at the taking of Maestricht 1633. In 1635 he joined the Dominicans and was sent to the Antilles in 1640. During the next seventeen years he resided in or visited most of the French West Indian islands, and was an eye-witness of many events of the Carib wars. He several times made short trips to France, and while there in 1656 was employed by M. de Cérillac to go to Grenada and examine that island with a view to the establishment of a permanent French colony. On his voyage out he was captured by an English privateer, but was ransomed, finished his commission satisfactorily, and finally returned to France in 1657. In 1654 he published his *Histoire générale des îles Saint-Christopher, de la Guadeloupe*, etc., enlarged and republished as *Histoire générale des Antilles habitées par les Français* (4 vols., Paris, 1667–71). This work is a standard authority for the region and period of which it treats, but should be consulted in connection with the later book of Labat. D. in Paris, 1687.

Herbert H. Smith.

Duties [M. Eng. *duetee*, deriv. of *due*]: in law, (*a*) those things which one is legally bound to do or refrain from doing; a legal obligation. The term is correlative to Rights (*q. v.*), and when a right is violated a duty is neglected. Civil duties, like civil rights, are those which arise out of the relationship of the individual to the state of which he is a member. Duties of imperfect obligation (so called in the civil law) are those not compellable by action. (*b*) In a general sense, a term synonymous with taxes, embracing all impositions or charges levied on persons or things; but in its usual and more restricted sense the term is used to designate indirect taxes upon the importation or exportation of goods, or the manufacture, sale, or consumption of goods within the country. In the U. S. Constitution the term is used for "stamp duties," as is shown by contemporary history. See *Elliot's Debates*.

Revised by F. Sturges Allen.

Dutt, Toru: Hindu poet; b. in Calcutta in 1856; daughter of Chunder Dutt, a learned East Indian; composed verses in English, French, and Hindustani, and

translated the *Vishnupurana* from Sanskrit into English blank verse. Some of her literary remains have been collected in *A Sheaf Gleaned in French Fields* (1881) and in *Ancient Ballads and Legends of Hindustan, with an Introductory Memoir by E. W. Gosse* (1882). D. in Calcutta, Aug. 30, 1877. H. A. BEERS.

Dutton, CLARENCE EDWARD: soldier and geologist; b. in Wallingford, Conn., May 15, 1841; graduated in arts at Yale 1860; first lieutenant and afterward captain Twenty-first Connecticut Volunteers 1862; second lieutenant of ordnance, U. S. army, 1863; first lieutenant 1867; captain 1873; major 1890. As an officer of volunteers he was engaged at Fredericksburg, Norfolk, Cold Harbor, Bermuda Hundred, and Drury's Bluff. In 1884 he was elected a member of the National Academy of Sciences. As an ordnance officer he has contributed to the literature of gunnery, and also written on the metallurgy of steel and on economics, but his more important publications are in the field of geology. In 1875 he was detailed to assist the U. S. survey of the Rocky Mountain region, under Maj. J. W. Powell; in 1879–80 he was secretary of a commission charged with the investigation of problems connected with the U. S. land system; from 1880 to 1891 he was a member of the U. S. Geological Survey. Among his geologic writings are *Geology of the High Plateaus of Utah* (Washington, 1880); *Tertiary History of the Grand Cañon District* (1882); *Hawaiian Volcanoes* (1884); *Mount Taylor and the Zuñi Plateau* (1886); and *The Charleston Earthquake of August 31, 1886* (1889). G. K. G.

Dutton, HENRY, LL. D.: jurist; b. at Plymouth, Conn., Feb. 12, 1796; graduated at Yale in 1818; was Professor of Law in Yale 1847–55; became Governor of Connecticut in 1854; and was a judge of the superior court and court of errors 1861–66. He prepared several digests, compilations of State statutes, etc., which were valuable additions to juridical literature. D. in New Haven, Apr. 12, 1869.

Duum'viri, or **Duo'viri** [Lat., a commission composed of two men; *duo*, two + *vir*, man]: the title of various magistrates of ancient Rome and her colonies. Two men jointly held the office, whence the name. The duumviri, "*juri dicundo*" (for pronouncing judgment), were chief magistrates in municipal towns. Naval duumviri were occasionally appointed to equip fleets. Duumviri "*perduellionis*" were appointed to try cases of treason (*perduellio*) and parricide. Quinquennial duumviri were the censors of municipal towns, and were chosen every five years, hence called *quinquennales* (from *quinque*, *annus*), but the duties of the office occupied only one year. The position was one of great dignity. Sacred duumviri were sometimes appointed to erect temples. There were also duumviri for performing other minor duties.

Duvergier de Hauranne, dü'vãr'zhi-ā'de-ō'raăn', JEAN: theologian; b. at Bayonne, France, 1581; was a fellow-student at Louvain with Jansen, and became a zealous reformer. His inflexible character and the asceticism of his life won him many followers, but his position in the Jansenist controversy made the Jesuists his bitter enemies, and finally the Government began to suspect his views. Richelieu threw him into prison in 1638, but after the death of the cardinal he was released. D. in 1643.

Duvergier de Hauranne, PROSPER: publicist; b. in Rouen, Aug. 3, 1798. He visited England, and became in 1824 contributor to the *Globe*, together with Guizot and Rémusat. Elected a deputy from Saucerre, he supported with all his might the policy of resistance which Casimir-Perier represented, and the cabinet of Molé he attacked in the chamber and in the press. The policy of Thiers he adopted with great sympathy, and finally broke altogether with Guizot. Elected a member of the Constitutional Assembly of 1848, he took his seat among the royalist minority. After the *coup d'état* he was imprisoned for a short time, and then banished, but was soon after allowed to return to France. During the second empire he devoted himself to literature. At the general senatorial election of 1876 he entered the senate, having declared himself in favor of a conservative republic; but his influence seemed to have decreased. He contributed to the *Revue des Deux Mondes*, and published *Des principes du gouvernement représentatif* (1838) and *Histoire du gouvernement parlementaire en France* (10 vols., 1857–73). In 1870 he became a member of the Academy. D. in Paris, May 22, 1881.

Duvernoy, dü'vãr'nwaă', GEORGES LOUIS, M. D.: zoölogist and anatomist; born at Montbéliard, France, Aug. 6, 1777. He edited Cuvier's *Lectures on Comparative Anatomy* (1805) at his request. He succeeded Cuvier in 1837 as professor in the College of France, and became in 1850 Professor of Comparative Anatomy. Among his important works is *Lectures on Organic Bodies* (1842). D. in Paris, Mar. 1, 1855.

Duveyrier, dü'vā'ri-ā', HENRI: traveler; b. in Paris, France, Feb. 28, 1840; the son of Charles Duveyrier, a political and dramatic writer, and nephew of Aimé Joseph Duveyrier, who, under the pseudonym of Mélesville, wrote a great number of theatrical pieces in collaboration with Scribe and others. After finishing his studies, Henri Duveyrier went to England to procure the support necessary to a tour of exploration through Africa. He first visited Algeria, and made some explorations of the northern parts of Sahara; and, having acquired the friendship of the chief of the Tuariks, he finally succeeded in penetrating to the center of the Sudan. After his return, in 1867, the Société de Géographie of Paris gave him its great gold medal and made him one of its perpetual secretaries. He published *Exploration du Sahara*; *Les Touaregs du Nord* (1864, with thirty-one maps); *Livingstone et ses explorations dans la région des lacs de l'Afrique orientale* (1873); and *La Tunisie* (1881); edited the *Année géographique* 1876–78. Committed suicide near Sèvres, April 26, 1892.

Duyckinck, dī'kingk, EVERT AUGUSTUS: editor and essayist: b. in the city of New York, Nov. 23, 1816; graduated at Columbia College in 1835. He was the founder and editor of the *Literary World*. With the aid of his brother George he published an important *Cyclopædia of American Literature* (2 vols., 1856). Among his works is a *History of the War for the Union* (3 vols., 1861–65). D. in New York, Aug. 13, 1878.

Duyckinck, GEORGE LONG: brother of Evert Augustus Duyckinck; b. in New York city, Oct. 17, 1823; graduated at the University of New York in 1843. He was joint author of the *Cyclopædia of American Literature* (1856), and published several biographies, among which was a *Life of George Herbert* (1858). D. in New York, Mar. 30, 1863.

Dvořák, dvōr'zhaăk, ANTONIN: musician; b. Sept. 8, 1841, at Mühlhausen, near Kralup, in Bohemia; the son of a butcher, and destined for the same trade. He learned to play the violin from the village schoolmaster, and in 1853 was sent to school at Zlonitz, where he studied under the local organist. Two years later he went to school at Kamenitz, where he learned the German language. In 1857 he entered the organ school at Prague and learned rapidly. He wrote much, but burned mostly what he composed. His first published composition was a patriotic hymn, *The Heirs of the White Mountain* (1873), he being then thirty-two years old. Soon afterward his opera *The King and the Collier* was accepted by the National theater and, having been withdrawn and altogether rewritten before performance, was successfully produced. His *Stabat Mater* was composed in 1876, published in 1881, and performed by the London Musical Society, Mar. 10, 1883. It made his fame in England, and soon was produced in the U. S., where it was sung by several societies. He then composed *The Spectre's Bride* for the Birmingham festival of 1885, *Saint Ludmilla* for the Leeds festival of 1886, *Requiem Mass* 1891. In Sept., 1892, he removed to New York to become the musical director of the National Conservatory of Music, and on Oct. 21 he made his first public appearance in a concert at which he produced a new *Te Deum* for solos, chorus, and orchestra. He has since published a mass, and a triple overture entitled *Nature, Life, Love*.
D. E. HERVEY.

Dwarfed Trees: trees stunted in their growth. They may be produced in three different ways—by grafting on dwarf slow-growing stocks, as, for example, the pear on the quince; by planting in small pots filled with poor soil, by which the plant is starved and stunted; and by causing a portion of the extremity of a branch to produce roots, and then cutting it off and planting it in a pot with poor soil. The last is the Chinese method, and is thus performed: The extremity of a branch 2 or 3 feet long in a fruit or flower bearing state is selected, and a ring of bark is taken off at the point where it is desired that roots should be produced. The part thus denuded of bark is covered with a ball of clay, kept moist with the frequent application of water. After the roots have grown out the branch is cut off, planted in a pot of poor soil, and sparingly supplied with water. The

dwarf tree will remain nearly of the same size for years. The pear-tree especially is often dwarfed, because in this condition it will produce fruit while young, and the trees can be kept in small compass. The apple is dwarfed by grafting it upon the paradise apple. With the exception of pears, dwarf fruit-trees are not common in the U. S.

Revised by L. H. Bailey.

Dwarfs [O. Eng. *dweorh*: O. H. Germ. *twërg* > Mod. Germ. *Zwerg*]: any animal or plant greatly below the usual size of its kind, particularly a human being of small dimensions. In ancient times dwarfs were kept by persons of rank for their amusement, and the Roman ladies employed them as domestics. In Europe the passion for dwarfs reached its height under the reigns of Francis I. and Henry II. of France. Among the most celebrated dwarfs were the following: Philetus of Cos, a philosopher and poet, who lived about 330–285 B. C.; Geoffrey Hudson, b. in 1619, who was 3 ft. 9 in. high; Joseph Borowlawski, b. in 1739, who attained the height of 39 inches, and was remarkable for acute intellect; and Nicolas Ferry, or Bébé (33 inches high), who was a favorite of Stanislas, King of Poland. Tom Thumb (Charles S. Stratton, b. at Bridgeport, Conn., in 1837; d. 1884) also was celebrated, and his performances as an actor were received with applause both in Europe and America. For dwarf races, see Pygmy Tribes.

In Scandinavian mythology, according to the Younger Edda, dwarfs were produced as maggots in the flesh of the great giant Ymer. The gods gave them the form and understanding of men. They shun the light and live in the earth and rocks, and are very skillful artisans. They made many excellent treasures for the gods. Four dwarfs, named North, East, South, and West, support the four corners of the heavens. See Scandinavian Mythology.

Dwelshauvers-Dery, Victor: mathematical physicist and engineer; b. at Dinant, Belgium, Apr. 25, 1836; educated at Dinant, the colleges of Dinant and Antwerp, the University of Brussels, and at Liège. He was *repétiteur* at the University of Liège 1861–69, when he was made Professor of Engineering. He is a civil and mechanical engineer, and is a doctor of science in mathematics and physics. Dr. Dwelshauvers-Dery represented his Government at the International Exhibition at London in 1862, and wrote an extended report on the mechanical division; also at the exhibitions at Paris in 1867, Vienna in 1873, Paris in 1878, Milan in 1882, Amsterdam in 1883, Antwerp in 1885, and Paris in 1889. His numerous writings are published mainly in the technical journals. He wrote much on regulation of machinery and the mathematical theory of regulators and governors up to about 1875; since then he has given more attention to the theory of heat-engines, and especially to the introduction of the Hirn calorimetric method of analysis of the distribution of useful and wasteful energies in the steam-engine, and has reduced to algebraic form and established the fundamental equations for the modern applied theory of these engines.

His *Exposé succinct de la Théorie pratique des Moteurs à Vapeur* (1880–82) will be found in *La Revue Universelle des Mines*. Several of his productions are separately printed, one of the most notable being his *Étude expérimentale thermique de la machine à vapeur*, in the series known as the encyclopedia of Léauté (Paris, 1892). He is a member of several learned and technical societies, and an honorary member of the American Society of Mechanical Engineers. He retains his position at Liège, and has done some important work in experimental research (especially in the elaboration of the methods inaugurated by Hirn) and in the organization of an engineering laboratory for such purposes.

R. H. Thurston.

Dwight: village and railway junction; Livingston co., Ill. (for location of county, see map of Illinois, ref. 4–F); 72 miles S. W. of Chicago. Agriculture and stock-raising are the chief pursuits. Pop. (1890) 1,354: (1900) 2,015.

Dwight, Benjamin Woodbridge, Ph. D.: author; b. in New Haven, Conn., Apr. 5, 1816; graduated at Hamilton College, New York, in 1835; was principal and proprietor of a high school for boys in Brooklyn and New York city for many years; author of *The Higher Christian Education* (New York, 1859); *Modern Philology, First and Second Series* (2 vols., New York, 1859–64); *The History of the Strong Family* (2 vols., Albany, 1871); *The History of the Dwight Family in America* (2 vols., New York, 1874); *Woman's Higher Culture*; and *The True Doctrine of Divine Providence*. D. in 1889.

Dwight, Harrison Gray Otis, D. D.: missionary; b. at Conway, Mass., Nov. 22, 1803; graduated at Hamilton College, New York, in 1825, and at Andover Theological Seminary 1828; became a missionary of the A. B. C. F. M. in 1830 to the Armenians, making Constantinople the center of his field of operations. He published several volumes at different times, as *Memoir of Mrs. Elizabeth Barker Dwight*, his first wife (New York, 1840); *Christianity Revived in the East* (1850; 2d revised ed., under caption *Christianity in Turkey*, London, 1854); *A Catalogue of Armenian Literature in the Middle Ages* (in *Journal of the American Oriental Society*), etc. He composed also several books and tracts in the native languages of the East. He was killed in a railway accident near Shaftesbury, Vt., when on a brief visit to the U. S., Jan. 25, 1862.

Dwight, John S.: music critic and writer; b. in Boston, Mass., May 13, 1813, and from his early youth connected with musical enterprises in Boston. On Apr. 10, 1852, appeared the first number of *Dwight's Journal of Music*, which continued until 1880. He was also the music editor of the *Harbinger*, a periodical published at Brook Farm, the author of a *History of Music in Boston*, and a frequent contributor to the daily press on musical topics. He was one of the leading members of the Harvard Musical Association. D. in Boston, Sept. 5, 1893.

D. E. Hervey.

Dwight, Joseph: soldier and judge; b. at Hatfield, Mass., Oct. 16, 1703; graduated at Harvard College in 1722; was judge of the court of common pleas of Hampshire co., Mass., and afterward of Berkshire County, and judge of probate. He was eminent both as a judge and a soldier. He commanded the Massachusetts Artillery at the reduction of Louisburg in 1745 with distinction, and led a brigade at Lake Champlain in the second French war in 1756. He was also for eleven years member of the general council of Massachusetts. D. in Great Barrington, Mass., June 19, 1765.

Dwight, Nathaniel, M. D.: physician and author; brother of Timothy Dwight (1752–1817); b. at Northampton, Mass., Jan. 31, 1770; prepared and published the first school geography ever issued in the U. S. He was also the author of *The Great Question Answered* and of *A Compendious History of the Signers of the Declaration of Independence*. D. June 11, 1831.

Dwight, Sereno Edwards, D. D.: Congregational divine; b. at Greenfield Hill, Conn., May 18, 1786; a son of Timothy Dwight (1752–1817). He graduated at Yale in 1803, and practiced law in New Haven with success 1810–16. He was afterward pastor of Park Street church, Boston 1817–26, and was president of Hamilton College 1833–35. Besides other works, he published the writings of Jonathan Edwards, with a biography (10 vols., New York, 1830). See his *Select Discourses*, with memoir by his brother, Rev. William T. Dwight, D. D. (Boston, 1851). D. in Philadelphia, Pa., Nov. 30, 1850.

Dwight, Theodore: journalist; a brother of Timothy Dwight (1752–1817); b. at Northampton, Mass., Dec. 15, 1764. He was a member of Congress (1806–07). He practiced law with distinction, and was a leader of the Federalist party. He was secretary of the Hartford Convention in 1814. His mother was a daughter of Jonathan Edwards. In 1817 he founded the *New York Daily Advertiser*, which he edited until 1835. He published *The Life and Character of Thomas Jefferson* (Boston, 1839) and *The History of the Hartford Convention* (New York, 1833), and was a contributor to *The Echo* (1791–96) and *The Political Greenhouse* (1799), political satires in verse, published by the Hartford Wits. See his *Life and Writings* (New York, 1846). D. in New York city, July 12, 1846.

Dwight, Theodore: author; son of Theodore Dwight, the journalist; b. at Hartford, Conn., Mar. 3, 1796, and graduated at Yale in 1814. He wrote, besides other works, a *Tour of Italy* (1824); a *History of Connecticut* (1841); a *Life of Garibaldi* (1859); *A School Dictionary of Roots and Derivatives*; *The Northern Traveler* (1841); *The Tour of New England*; *The Father's Book*; *First Lessons in Modern Greek*; *The Roman Republic of 1849* (1851); and *The Kansas War* (1859). D. in Brooklyn, N. Y., Oct. 16, 1866.

Dwight, Theodore William, LL. D.: jurist, professor, and editor; b. at Catskill, N. Y., July 18, 1822; graduated at Hamilton College, New York, in 1840, and at Yale Law School in 1842. In 1846 he was elected Maynard Professor

of Law in Hamilton College, and there established a law school. In 1858 he was chosen Professor of Municipal Law in Columbia College, New York, and was soon made warden of the law school, a department of the college organized under his direction. He received the degree of doctor of laws from Rutgers College, New Jersey (1859), and from Columbia College (1860). He published an *Argument in the Rose Will and Charity Cases* (1863), and other arguments in leading law cases. In association with Dr. E. C. Wines he published *Prisons and Reformatories in the United States.* He edited *Maine's Ancient Law* (1864). As associate editor of the *American Law Register* he wrote articles which were separately published, as *Trial by Impeachment*, etc. He was elected non-resident Professor of Constitutional Law in Cornell University, New York (1868), and lecturer in Amherst College, Massachusetts, on the same subject (1869). He was a member of the New York constitutional convention of 1867, and early in 1873 was vice-president of the New York board of State commissioners of public charities, president of the New York prison association, and an active member of the well-known "committee of seventy" of the city of New York. In Jan., 1874, he was appointed by Governor Dix, of New York, a judge of the commission of appeals, a court sharing the duties of the court of appeals. D. in Clinton, N. Y., June 28, 1892.

Dwight, Timothy, D. D., LL. D.: divine and scholar; b. at Northampton, Mass., May 14, 1752. He graduated at Yale College in 1769, after which he was a tutor in that institution for six years. Between 1778 and 1782 he was a chaplain in the army or lived with his mother at Northampton; in 1783 he became minister of a church at Greenfield, Conn., where also he was principal of a flourishing academy. In 1795 he was elected president of Yale College, in which he also became Professor of Divinity at the same time. As such it was his function to preach in the college chapel. He was an able preacher, and was eminently qualified as an instructor of young men. He continued to be president of Yale College until his death. His chief works are *The Conquest of Canaan*, an epic poem (Hartford, Conn., 1785); *Theology Explained and Defended in a Series of 173 Sermons* (5 vols., New York, 1818), often reprinted: and *Travels in New England and New York* (4 vols., New Haven, 1821). D. at New Haven, Jan. 11, 1817. His influence through the republication of his *Theology*, etc., in Great Britain was great. See W. B. Sprague, *Life of T. Dwight*, in Sparks's *American Biography*, vol. iv., second series; also Sprague's *Annals of the American Pulpit*, vol. ii., pp. 152–165. Revised by George P. Fisher.

Dwight, Timothy, D. D., LL. D.: grandson of Timothy Dwight (1752–1817); b. at Norwich, Conn., Nov. 16, 1828; graduated at Yale College 1849; was a graduate student two years and a tutor in the college 1851–55; May 22, 1855, was licensed to preach; studied at the universities of Bonn and Berlin 1856–58; became Professor of Sacred Literature in Yale Divinity School in 1858; was ordained a minister Sept. 15, 1861; has frequently contributed to the *New Englander Magazine*, of which he became associate editor in 1886. He has edited the volumes on Romans, Philippians-Philemon, Timothy-Hebrews, James-Jude, in the American edition of the English translation of Meyer's *Commentary*; also similarly the American edition of the English translation of Godet's *Commentary* on John's Gospel. He was president of Yale College 1886–98.

Dwight, William Buck: scientist; son of Harrison Gray Otis Dwight; b. in Constantinople, Turkey, May 22, 1833; went to the U. S. in 1849; graduated at Yale College 1854; Union Theological Seminary, New York city, 1857; Yale scientific school 1859; 1859–65 principal and proprietor of Englewood Female Institute, Englewood, N. J.; 1865–67 occupied in mining and geological examinations in Virginia and Missouri; 1867–70 principal of the Officers' Family School at the U. S. Military Academy, West Point, N. Y.; 1870–78 associate principal and instructor in natural sciences in the State Normal School at New Britain, Conn.; 1878 appointed Professor of Zoölogy in the Martha's Vineyard summer institute, Massachusetts; in 1882 appointed Professor of Natural History and curator of the museum in Vassar College, Poughkeepsie, N. Y.; in 1885 invented a machine for making thin sections of rocks and fossils. He has investigated the Wappinger valley limestones of Dutchess co., N. Y., and the Taconic limestones of Canaan, N. Y., and published the results of his studies in scientific periodicals.

Dwight, William Theodore. D. D.: clergyman; son of Timothy Dwight (1752–1817); b. at Greenfield Hill, Conn., June 15, 1795; graduated at Yale in 1813; practiced law in Philadelphia for ten years (1821–31), when he entered the ministry, and was settled as a Congregational clergyman at Portland, Me., where he remained for thirty-two years (1832–64). His ministry was one of great success, and his influence was very great, not only throughout Maine, but also throughout the Congregational denomination at large. D. in Andover, Mass., Oct. 22, 1865.

Dwina, or **Northern Dwina**, dwee'nă: a large river of Russia; formed by the confluence of the Suchona and Jug, in the government of Vologda. It flows nearly N. W., and enters the Gulf of Archangel by three principal mouths. Near Archangel its width exceeds 4 miles. It is free from ice from May to October. The Vytchegda is its principal tributary. Its length is estimated at 450 miles; with the Suchona, 760 miles.

Dwina, or **Western Dwina** (Germ. *Düna*): a river of Russia; rises in the government of Tver near the source of the Volga; forms the boundary between Livonia and Courland and enters the Gulf of Riga, 7 miles below the town of Riga, where it has an average depth of 26 feet. Its length is about 580 miles. From Riga to Dünaburg the ship-canal now building (1899) across Russia from the Baltic to the Black Sea follows the Dwina.

Dyaks: the aborigines of Borneo; occupy mostly the interior of the island. See Borneo.

Dybeck, dü'bek, Richard: Swedish antiquarian; b. on Sept. 1, 1811. His archæological works throw much light on the antiquities of Sweden. He also made large collections of Swedish ballads. His *Sverikes Runurkunder* (1860–76) is a standard work. D. July 28, 1877. R. B. A.

Dyck, Anthony Van: See Vandyke.

Dyea: See the Appendix.

Dyeing: the art of coloring yarn or cloth; has been practiced from the most remote antiquity. The fibers and fabrics usually dyed are either cotton, linen, silk, or wool. (See Textile Fabrics.) The coloring-matters employed are either the natural products of animals or plants, or are the results of chemical processes. (See Dyestuffs.) Thorough cleansing of the fibers is an indispensable preliminary to dyeing. Resinous and oily matters must be removed to give the dye liquors free access to the fibers, and natural coloring-matters must be destroyed in order to secure the brightest and clearest tints of the dyes. Cotton is successively boiled with lime, soda-ash, and rosin soap; it is then soured with dilute sulphuric acid, and finally treated with hypochlorite of lime (bleaching-powder). Linen is subjected to repeated treatment with water, alkalies, acids, and hypochlorite of lime, alternating sometimes with exposure on the grass to air and sunlight. Silk is boiled in a solution of fine soap to remove the gelatinous, resinous, and fatty matters which make up a large proportion of its weight. Wool is thoroughly cleansed by washing in weak soap or carbonate of soda solution, putrid urine, or weak ammonia. For the details of these operations, see Bleaching.

The dyeing is effected upon loose or unspun fibers, yarn, and woven cloth, and the operations performed differ according to the nature of the fiber, its condition, and the dyestuff used. Loose materials are dyed in tubs or vats, yarn is hung over sticks which rest upon the top of the vat and is turned from time to time; or warp yarns are dyed in long chains, while pieces are dyed in a continuous dyeing machine, divided into a series of compartments which contain the necessary mordants and dyestuffs, or upon the jigger, a machine consisting of two rollers placed above a tank which contains the dyeing liquor; the pieces are wound back and forth through the dye-bath upon the rollers.

Some colors combine with the fibers very readily as soon as they are immersed in their solutions; such colors have been called *substantive*. Silk and wool take colors much more readily than cotton and linen; many dyes are therefore substantive for these animal fibers. Many of the aniline colors belong to this class. With such colors the operations of dyeing are very simple. They consist in the mere immersion of the yarn or cloth in cold or hot solutions of the dye, with sufficient handling to secure the even distribution of the color. Agents are often added to fix or set the color, or to obtain a more even shade [*assistants*], such as acids, alkalies, tin salt, alum, etc.

For adjective dyes, those which will not unite directly

with the fibers, the aid of *mordants* is necessary. Mordants are bodies which possess an affinity for the colors, and which can be fixed in an insoluble condition on or within the fibers. Some are metallic oxides or salts, as alumina, oxide of iron, oxide of chromium, oxide of tin, tannate of tin, etc.; others, as tannin, are of a different character. The mode of applying the mordant depends on the fabric, as well as on the character of the mordant itself. Silk and wool, when immersed in a solution of alum, take up a considerable quantity of the salt without decomposing it. The acetates of alumina, iron, and chromium are easily decomposed, with the liberation of a portion of the acetic acid and the formation of an insoluble basic acetate. By boiling cotton in their solutions the fibers become thoroughly impregnated with the insoluble compounds, and when the yarn is transferred to the solution of the dyestuff the color unites with the mordant, forming insoluble colored bodies in or upon the fibers, which are called LAKES (*q. v.*). The goods thus become permanently dyed. The same decomposition of the aluminous or ferrous salt occurs if the goods are simply immersed and then hung up in the air. Chloride of tin is decomposed by boiling its dilute solution, with the liberation of hydrochloric acid and the formation of insoluble oxide of tin. Sometimes the insoluble oxide or salt is produced by first immersing the goods in a soluble salt, and then passing them through a second solution of another agent. Exposing fabrics to an iron salt, and then to an alkaline lye, fixes oxide of iron. A lead salt and an alkaline lye fix oxide of lead. Stannate of soda, followed by a solution of nutgalls, sumach, etc., fixes tannate of tin in the fibers.

Mordants often affect the natural tints of the dyes, thus enabling the dyer to produce a variety of shades with the same dye. Oxide of iron is most remarkable in this respect; it changes the red color of madder, logwood, Brazilwood, etc., to shades of purple, lilac, chocolate, and even black, according to the proportions in which it is employed. The oxide of tin tends to brighten the shades, while alumina fixes them in their natural tints. This is a very important circumstance in calico-printing, as it enables the dyer to produce several colors on the same cloth by one operation of dyeing. (See CALICO-PRINTING, *Madder Style.*) Metallic pigments are often produced in the yarn or cloth by the successive application of the agents necessary for their production. Thus when cloth mordanted with oxide of iron is passed into an acidulated solution of ferrocyanide of potassium, an insoluble Prussian blue is at once produced. Goods impregnated with oxide of lead by immersion in acetate of lead become bright yellow in a solution of bichromate of potash, owing to the formation in the fibers of insoluble chromate of lead. By subsequently boiling with lime-water the yellow is changed to orange basic chromate. Indigo blue is produced in cotton by immersing in a solution of colorless reduced indigo (see CALICO-PRINTING, *Indigo Styles*) and exposure to the air, when the indigo blue is regenerated by oxidation in an insoluble form.

The following methods of dyeing are in use:

(1) Direct dyeing in water, usually with an assistant; as example, see receipt 3.

(2) Direct dyeing with the mordant in the dye-bath; as example, see receipt 5.

(3) Mordanting followed by dyeing; as example, see receipt 15.

(4) Dyeing (called here *stuffing*) followed by mordanting (called *saddening*); as in receipt 55.

(5) Mordanting, dyeing, and saddening.

(6) Production of the coloring-matter upon the fiber, as in the case of some azo-reds.

The following are a few typical ways of dyeing; more detailed statements are given in the articles on the various dyestuffs:

REDS.

On Cotton.—(1) The most beautiful red on cotton, Turkey red, is produced by means of alizarin dyed upon an alumina mordant. This has been largely superseded by the alizarin red, dyed frequently as follows: The bleached cotton is thoroughly impregnated with a water solution of alizarin assistant (made by the action of sulphuric acid upon castor oil), dried, steamed, mordanted in acetate of alumina, dunged with arseniate or phosphate of soda, dyed in an alizarin bath, again treated with alizarin assistant after thorough washing, steamed, and very carefully washed with hot soap. (2) Aniline reds and pinks on cotton mordanted in nut-galls or sumach, followed by a tin or antimony salt. (3) Substantive reds produced by benzopurpurin and Congo red upon unmordanted cotton, and dyed in a bath containing soap or carbonate or phosphate of soda.

On Wool.—(4) Mordant with alum and tartar and dye with alizarin. (5) Cochineal, with cream of tartar, sumach, and fustic. (6) An artificial red (azo-red) in a bath containing sulphuric acid and sulphate of soda. (7) *Pink.* An eosine in a bath containing alum. (8) Aniline shades are fixed on wool without mordants in acid baths.

On Silk.—(9) Peach-wood and fustic, followed by red spirits, with annatto for scarlets, cochineal and safflower for finer tints. (10) *Pink.* Safranine or rhodamine in soap bath, or an eosine in a soap bath acidulated. (11) Benzidine reds in a soap bath, or basic anilines. (12) Acid artificial reds are applied to silk in a warm bath, slightly acidulated with acetic, tartaric, or sulphuric acid.

BLUES.

On Cotton.—(13) Prussian blue produced by an iron mordant, followed by ferrocyanide of potassium. (14) Indigo vat, a solution of reduced indigo. (15) *Aniline blues.* Mordant with sumach or tannin, then a salt of antimony or of tin; dye in warm bath.

On Wool.—(16) Prussian blue, as for cotton. (17) Indigo extract, with argol and alum. (18) Aniline blue, with sulphuric acid and sulphate of soda.

On Silk.—(19) Prussian blue, as for cotton. (20) Indigo extract and alum. (21) Anilines, with soap and sulphuric acid.

YELLOWS AND ORANGES.

On Cotton.—(22) Chromate of lead, produced by bath of acetate of lead, followed by bichromate of potassa. (23) The chrome yellow is deepened to orange by boiling in lime-water. (24) Mordant with tannin and dye with chrysoidine or auramine. (25) Mordant in weak protochloride of tin, dye in quercitron bark, fix with protochloride of tin. (26) Chrysamine in a bath containing soap or phosphate of soda.

On Wool.—(27) Mordant in tartar and alum; dye in mixture of quercitron, sumach or fustic, and red spirits. (28) Weld, with alum and tartar. (29) Picric acid. (30) Acid coal-tar yellows. (31) Flavine, with a tin mordant. *Orange.* (32) Alizarin orange with alumina mordant. (33) Acid artificial orange.

On Silk.—(34) *Yellow to orange.* Annatto, with alum and white soap. (35) Weld, with alum and tartar. (36) Picric acid. (37) Artificial neutral and basic yellows and oranges in soap baths. (38) Acid artificial yellows in acid baths.

GREENS.

On Cotton.—(39) Dye blue, then yellow with fustic quercitron bark or chrome yellow. (40) Aniline green, on cotton mordanted with sumac.

On Wool.—(41) Dye yellow with fustic and alum, then blue with indigo. (42) For olive, use fustic with logwood, madder, and peach-wood, following with copperas. (43) Aniline green. (44) Picric acid and indigo carmine.

On Silk.—(45) Fustic, with sulphate of indigo and alum, using logwood and copperas to darken shades. (46) Basic artificial greens in a soap bath. (47) Acid aniline green, with sulphuric acid or cream of tartar. (48) Picric acid and indigo carmine.

PURPLES, VIOLETS, AND LILACS.

On Cotton.—(49) Mordant with red spirits, and dye with logwood, to which a little red spirits and acetate of alumina have been added. (50) Dye light blue, then redden in logwood with alum. (51) Mordant in sumach, then in red spirits, and dye in logwood. (52) *Safflower lavender.* Dye light blue, then cover with safranine. (53) Dye alizarin on a mordant of alumina and oxide of iron. (54) *Aniline colors.* Mordant with sumach, followed by perchloride of tin or tartar emetic.

On Wool.—(55) Cudbear, logwood, barwood, camwood, or peach-wood, with alum. (56) Basic aniline violets in a neutral or soap bath. (57) Acid violets in acid baths.

On Silk.—(58) Basic and acid violets, as for wool.

BLACKS.

On Cotton.—(59) Sumach, followed by copperas, then by logwood, then by weak copperas; the color is improved by adding fustic and replacing the second copperas bath by acetate of iron. (60) For blue-black preceede 59 by the in-

digo vat. (61) Aniline black. Impregnate with aniline salts and an oxidizing agent. Oxidize by dunging or in an oxidizing machine, and treat with bichromate of potash. See CALICO-PRINTING.

On Wool.—(62) Mordant with copperas and blue vitriol, then logwood, finally copperas. (63) Mordant in bichromate of potassa; hang in the air; dye in logwood, barwood, and fustic; sometimes finish in copperas.

On Silk.—(64) Copperas and logwood repeated; the addition of nitrate of iron and fustic improves. (65) For blue-black, dye in Prussian blue and follow with 64. Artificial blacks in acid or soap baths.

DRABS.

On Cotton.—(66) Sumach, followed by weak copperas, then fustic, Lima-wood, and logwood; raised with alum.

On Wool.—(67) Madder, peach-wood, logwood, fustic, with alum and copperas.

On Silk.—(68) Sumach, fustic, and logwood, with copperas.

BROWNS.

On Cotton.—(69) *Catechu brown.* Boil in catechu, pass through hot bichromate of potassa, wash in hot water containing a little soap. (70) *Chocolate or French brown.* Dye in spirit yellow, 25, then in logwood, and raise with acetate of alumina. Basic aniline browns on tannin mordants.

On Wool.—(71) Pass through a bath of fustic, madder, peach, and logwood; then through dilute copperas. (72) Bath of bichromate of potassa, argol, and alum; then of madder, peach, and logwood. (73, 74) Neutral and acid coal-tar browns.

On Silk.—(75) Neutral and basic coal-tar browns in soap baths. (76) Acid coal-tar browns in acid baths.

For further details, see Sansone's *Dyeing*; Delmart's *Echtfärberei der losen Wolle*; Soxlet's *Färberei der Baumwolle*; Hurst's *Silk Dyeing, Printing, and Finishing*; Hummel's *Dyeing of Textile Fabrics*; and Kertesz's *Die Anilinfarbstoffe.*

C. F. CHANDLER.
Revised by L. M. NORTON.

Dyer, ELIPHALET: jurist; b. at Windham, Conn., Sept. 28, 1721; graduated at Yale College in 1740, and began to practice law in 1745. During the French war (1755) he commanded a Connecticut regiment, and in 1762 he was elected a member of council. In 1763 he went to England as agent for the Susquehanna Company, and he was a delegate to the Stamp Act Congress in 1765. He was a member of Congress during the war of Independence. D. in Windham, May 13, 1807.

Dyer, GEORGE: antiquary and scholar; b. in London, Mar. 15, 1755. He was educated at Cambridge; lived by literary labor in London after 1792. He edited Valpy's Classics, and wrote, besides other works, a *History of the University of Cambridge* (2 vols., London, 1814). D. in London, Mar. 2, 1841.

Dyer, JOHN: English poet; b. in Aberglasney, Carmarthenshire, in 1700. He was originally a painter, and studied art in Italy. He published in 1727 a poem entitled *Grongar Hill*, remarkable for its descriptions of natural scenery. Having taken holy orders in 1740, he obtained the living of Calthorpe, Leicestershire, which he exchanged for livings in Lincolnshire. Among his works are the *Ruins of Rome* (1740) and *The Fleece*, a didactic poem (1754). D. July 24, 1758.

Dyer, WILLIAM TURNER THISTLETON, B. Sc., M. A., Ph. D., C. M. G.: English botanist; b. July 28, 1843; educated at Oxford, King's College, and Halle; Professor of Natural History, Royal Agricultural College, Cirencester (1868); Professor of Botany, Royal College of Science for Ireland (1870); assistant director of the Royal Gardens, Kew (1875–85); became director (1885). He has published *The Flora of Middlesex* (with Dr. Trimen, 1869) and the English translation of *Sachs's Text-book of Botany* (1875).

CHARLES E. BESSEY.

Dyers' Broom, called also **Woadwaxen**, **Dyers' Greenweed**, and **Whin**: a low shrub with yellow flowers and simple leaves. It is the *Genista tinctoria*, a European leguminous plant now thoroughly naturalized in New England. It is said to be the *genêt*, the bush which gave its name to the Plantagenet family. It was introduced into New England for garden cultivation, for its tops were formerly used to make a yellow dye for domestic purposes. It is used in Russia as a preventive to hydrophobia, but it appears to be simply a hydragogue cathartic of no great value.

Dyersburg: city; capital of Dyer co., Tenn. (for location of county, see map of Tennessee, ref. 6–B); situated on railway, and at the head of navigation on Forked Deer river; 76 miles N. of Memphis; has four churches, fine school, cotton compress, sawmills, machine-shop, brick-yard, planing-mills, roller flouring-mills, wooden-bowl factory, cottonseed oil mill, electric lights and water-works. Pop. (1880) 1,010; (1890) 2,009; (1900) 3,647.

EDITOR OF "NEAL'S STATE GAZETTE."

Dyersville: town; Dubuque co., Ia. (for location of county, see map of Iowa, ref. 4–K); situated on Ch. and No. West. and Ill. Cent. railways; 30 miles W. of Dubuque; has four churches, and public and parochial schools. The principal industries are manufacturing and trading, the town being one of the best live-stock markets in the State. Pop. (1880) 975; (1890) 1,272; (1900) 1,323.

EDITOR OF "COMMERCIAL."

Dyers' Weed or **Weld**, also called **Woold** and **Rocket**: the *Reseda luteola*, a European herb of the family *Resedaceæ*, naturalized in the vicinity of New York. It considerably resembles its congener, the mignonette. It is extensively cultivated in Holland and France, and to some extent in England, and is a valuable yellow dyestuff. Its quality is much improved by cultivation. It was formerly used in medicine as a sedative, diaphoretic, and diuretic.

Dyestuffs: bodies used to impart color to textile fibers and fabrics. Many colors exist already formed in plants; others are produced from colorless bodies by oxidation or other processes. Lakes are compounds of coloring-matters with metallic oxides, such as alumina, the oxides of tin, lead, antimony, and barium. They are generally prepared from cochineal, alizarin, weld, Brazil-wood, aniline colors, etc. (See LAKES.) The following are some of the most important dyestuffs of animal and vegetable origin:

I. ANIMAL DYES.—*Cochineal*, the female insect of the species *Coccus cacti*, is by far the most important. Its coloring principle is carminic acid. It produces scarlets and crimsons of great brilliancy on silk and wool. Carmine is nearly pure carminic acid. *Kermes*, *kermes grains*, *alkermes* is the insect *Coccus ilicis*, one of the most ancient dyes for red shades on silk. *Lac* is the *Coccus laccæ*, a similar insect. The *Tyrian purple* was obtained from mollusks, and is no longer used. *Galls* are excrescences produced on the leaves and leaf-stalks of the oak by punctures of the gall-wasp, made for the purpose of depositing her eggs. Their characteristic constituent is tannic acid, which produces drabs and blacks with iron salts. They also serve as a mordant for some aniline colors, and are the basis of most writing-inks. *Sepia* is the fluid of cuttlefish; it is not used as a dye, but as a water-color by artists. *Murexide* is a purple compound produced by the action of nitric acid and ammonia on uric acid from guano; it is no longer used.

II. VEGETABLE DYES.—These are extremely numerous, although only a few are in general use. They are derived from different parts of plants: (1) From roots the most important is *madder* (*Rubia tinctorum*), which contains two principles, alizarin and purpurin. These bodies produce on cotton the most permanent reds, purples, and chocolates, which makes them specially applicable for calico-printing. Madder appears in commerce in the form of ground root; garancin, the ground root boiled with sulphuric acid and washed; and extract, a tolerably pure alizarin. The use of madder as a dyestuff has nearly ceased, and it has been replaced by alizarin manufactured artificially from the anthraeene of coal-tar. *Munjeet* is the Indian madder. *Alkanet* is the *Anchusa tinctoria*, formerly used for lilac, lavender, and purple on silk. Its colors were always fugitive. *Barberry* produces a yellow of little importance. *Turmeric*, the tuber of *Curcuma tinctoria*, or Indian saffron, produces a fugitive yellow. It is now chiefly used for yellow lacquers, as a test for alkalies, for mixing with curry-powder and with mustard, and in dyeing wool. *Soorangee* is a yellow much used in India. (2) Among the more important woods are *logwood*, containing hæmatoxylin, extensively used for reds, purples, violets, blues, and blacks; *Brazil-wood*, comprising several species of *Cæsalpinia*, found in Central and South America and in Japan, known as Lima, Pernambuco, Santa Martha, Peach, Nicaragua, Sapan or Japan, etc. It yields a coloring-matter known as brazilin, which produces rich reds. *Sandal-wood*, from Ceylon, and *camwood* or *barwood*, from Africa, contain santalin, which gives reds, violets,

and scarlets. *Fustic*, or yellow wood, is the *Morus tinctoria* from the West Indies. *Fustet*, young fustic, or Hungarian yellow wood, is the *Rhus cotinus*. (3) The only bark of special importance is the *quercitron* from the *Quercus tinctoria*, which contains quercitron and produces a rich yellow, and greens when combined with blue; a pulverized preparation made from it is known as florine. *Lu-kao*, or *Chinese green*, is a green lake prepared by the Chinese from the bark of a species of *Rhamnus*, or buckthorn. (4) Leaves of the *Rhus cotinus* are known as *sumach*; they produce a yellow, but are generally used, on account of the tannic acid they contain, either as a mordant or to produce blacks, etc., with iron salts. *Chica*, which gives an orange on cotton, consists of the leaves of *Bignonia chica*. (5) *Flowers*. The petals of *Carthamus tinctorius* constitute safflower. They contain a useless yellow coloring-matter, soluble in water, and a beautiful pink (*carthamin*), soluble in alkalies. *Saffron*, a beautiful yellow dye, consists of the stigmas of *Crocus sativus*. (6) *Fruit*. Persian, French, Turkey, etc., berries are derived from several species of *Rhamnus*. They contain a beautiful yellow dye (*chrysorhamnine*) and olive yellow (*xanthorhamnine*). They are used in calico-printing, for paper pulp, and for lakes. *Annatto* or *annotto* is an extract of the seed-pellicles of *Bixa orellana*. It is used for yellows, oranges, and with reds for scarlet. It is also employed for coloring butter and cheese. *Divi-divi* is the pod of the *Cæsalpinia coriaria*. It contains tannic acid. *Catechu*, *terra japonica*, and *gambir* are the extracts prepared from the fruit, wood, twigs, and unripe pods of several plants growing in India. Their active principle, as well as that of *divi-divi*, is a species of tannic acid. They are used as mordants, with iron salts for drabs and blacks, and in tanning skins; catechu and gambir furnish browns. (7) *Entire plants*. *Indigo* from various species of the *Indigofera*, and *woad* from the *Isatis tinctoria*, contain a glucoside (*indican*) which by fermentation yields indigo blue (*indigotine*). This color has long been used as one of the most permanent blue dyes. Several preparations are employed by the dyer: (*a*) solution of colorless or reduced indigo, with which the cloth or yarn is impregnated, and from which the insoluble blue indigotine is precipitated on exposure to the air; (*b*) in solution in sulphuric acid as sulpho-purpuric acid, purple blue, or as sulpho-indigotic acid, deep blue; (*c*) as carmine of indigo, or extract, the soda compounds of the above-mentioned acids, usually the sodium salt of indigo-disulphonic acid. It is used for cotton, silk, and wool, and in calico-printing. *Lichens*. A variety of lichens yield, by a kind of oxidation, a series of products known as *archil* or *orchil*, *cudbear* or *persio*, and *litmus*. The weeds (from the Canaries, the Pyrenees, etc.) are pulverized and moistened with urine, when certain acids they contain are changed to the coloring-matter *orcein*. Archil appears in commerce as a purple paste, cudbear as a red powder, litmus as a blue lake. Before the introduction of the aniline colors the most beautiful purples for silk were obtained from archil. *Weld*, the *Reseda luteola*, contains lutioline, which yields a rich but fugitive yellow. Extracts containing the coloring-matters in concentrated form are prepared from most of the dye-woods, and are found in trade in the liquid or solid form.

III. Artificial or Chemical Colors.—(1) Pigments are insoluble metallic compounds, either produced in the yarn or cloth by successively applying the necessary reagents, or attached mechanically to the surface by albumen or other adhesive substances. *Prussian blue* is a ferrocyanide of iron; *chrome yellow* and *orange* are chromates of lead; *Schweinfurt green* is the aceto-arsenite of copper; *Guignet's green* is a hydrated oxide of chromium; *ultramarine* is a compound of alumina, silica, soda, and sulphur. (2) *Coal-tar colors* which have become equal to if not more important than the natural ones. The consumption of these colors is rapidly increasing in the tinctorial arts. This entirely new class of dyestuffs, the creation of modern chemistry, is derived from the refuse tar produced in gas-works from bituminous coal. The colors belong to four distinct series: (*a*) The aniline series, including the red rosaniline salts, the purple, violet, and blue substitution products derived from them, the greens, yellows, browns, black, and pinks, all of which are described under Aniline Colors (*q. v.*). (*b*) The phenol or carbolic acid series, including picric acid, and other nitro-coloring matters, the eosines, coerulein, etc. (See Phenol Colors.) (*c*) The azo-coloring-matters, chrysoidine, Bismarck brown, the tropæolins, the numerous wool scarlets, and the benzidine or tetrazo-colors. (*d*) Anthracene series, of which artificial alizarin anthrapurpurin, alizarin orange, anthracene blue, etc., are the representatives. See Anthracene, Alizarin, and Madder.

All the important animal and vegetable dyestuffs above mentioned are described more fully under their respective titles. For fuller information, consult the works on dyeing mentioned in the article on Dyeing.

C. F. Chandler.
Revised by L. M. Norton.

Dying, or Deathbed, Declarations: in law, statements made by a person in the prospect of impending death with regard to the cause of his death. In most countries such statements can not be received in civil cases as evidence, and in criminal cases only when the cause of death of the deceased is the subject of the charge. They must be made in the firm belief that death will soon follow, must relate to facts only, must be complete and unqualified, and must be freely made. They are further subject to the ordinary rules of evidence. The theory is that the knowledge of the approach of death creates an obligation at least equal to that of a judicial oath.

Revised by F. Sturges Allen.

Dyke: See Dike.

Dykes, James Oswald, D. D.: minister of the Presbyterian Church of England; b. in Port Glasgow, Scotland, Aug. 14, 1835; educated at Edinburgh University, New College, Edinburgh, and Heidelberg and Erlangen Universities, Germany. After two Free Church pastorates in Scotland, and four years of work as preacher, teacher, and editor in Melbourne, Victoria, he settled in London in 1869, where he was minister of the Regent Square Presbyterian church till 1888, when he became principal and Barbour Professor in the Theological College of the Presbyterian Church of England. Besides editing for some years the *British and Foreign Evangelical Review*, he has published *On the Written Word* (London, 1868); *The Beatitudes of the Kingdom* (1872); *The Laws of the Kingdom* (1873); *The Relations of the Kingdom* (1874)—these three in one volume; *The Manifesto of the King* (1881), *From Jerusalem to Antioch: Sketches of the Primitive Church* (1875; 5th ed. 1890); *Abraham, the Friend of God* (1877; 3d ed. 1878); *Sermons* (1882); *The Law of the Ten Words* (1884); *The Gospel according to St. Paul* (1888); *Plain Words on Great Themes* (1892).

Willis J. Beecher.

Dynam'eter [contraction of dynamometer; from Gr. *δύναμις*, power + *μέτρον*, measure]: an instrument for determining the magnifying power of a telescope. This power is expressed by the ratio of the solar focal distance of the object-glass to the focal distance of the eye-piece, considered as a single lens; and this ratio being the same as the ratio of the effective diameter of the object-glass of the telescope to the diameter of the image of the same formed at the solar focus and seen through the eye-piece, the object of the instrument is to measure the exact diameter of this image, which can be either projected on mother-of-pearl or measured by optical means. Ramsden proposed for this purpose the double-image dynameter, or micrometer, which is formed by dividing the eye-lens of a positive eye-piece into two equal parts, and mounting them so that the divided edges are made to slide along each other by means of a fine screw apparatus. Each semi-lens gives a separate image; and the distance of the two centers, measured by the revolutions of the screw when the borders of the two images are brought into contact, gives the distance of the centers of the images or the diameter of one of them.

Dynam'ics: literally and in modern usage, the science which has for its object the investigation of the laws and principles which govern the action of forces. The science of dynamics may be divided into various branches, each embracing the principles applicable to some special conditions of the action of forces or of the bodies acted on, such as the subject of *statics*, or the equilibrium of forces; the subject of *kinetics*, the action of forces in connection with the motions and changes which they produce; and the special applications of both these subjects to bodies in the *solid* and *fluid* states.

The abstract idea of force is derived from our knowledge and experience in regard to the forces of nature—gravitation, inertia, friction, molecular force, muscular force, etc. These forces are so far similar and identical in their effects as to admit of a common measure, and of being subjected to the same laws and principles. In general they arise from the action of one body on another in such a manner that this action is distributed among all the particles or is exerted through a surface. But it is nearly always possible to

assume a single force acting through a definite point and in a particular direction, which shall be equivalent in its effects to such combined or distributed forces. The force of gravity, for instance, is an attractive influence exerted between two bodies, which can only be supposed to be exerted by the separate particles or molecules of each, and yet a single force equivalent to the sum of the attractions of all the particles of a body, and acting through its center of gravity, is usually assumed to represent the force of gravity. A force may thus be regarded as an influence or action between two bodies or between two molecules of matter which requires two elements for its determination—its *line of action* and its *magnitude*.

This abstract idea is applicable to all forces, and furnishes the starting-point or basis of the system of principles which constitutes the science of force. These principles depend also on certain axioms of physical science derived from a consideration of the nature of forces and their effects; and also upon certain geometrical laws involving the relation between the magnitudes of forces and motions, and their equivalent components. To compare the magnitudes of forces a standard unit or measure must be adopted which is applicable to all forces under all ordinary conditions. As all standards of measure are arbitrary, such a unit of measure may be found in the effects which a given force will produce under conditions which permit of the effect being measured by some other known standard of measure.

To explain the standard or unit of force adopted in dynamical science, it will be necessary to explain just what is understood by the mass of a body. If we suppose (*for the purpose of this explanation only*) that the ultimate particles or molecules of all substances are the same, and that we may designate by the term *density* the degree of proximity of the particles of any body to each other, then the number of particles in a given *volume* may be taken to denote the mass of the body—i. e. this number would represent the *quantity of matter in the body*. This quantity of matter or mass has important properties as regards force. First, the action of the force of gravity upon the body is directly proportional to the mass; and this mass possesses a peculiar power of resistance to any force which acts to change its condition in respect to motion. It is inert as regards any power in itself to change, but a force of resistance is developed with the action of an impressed force. The truth of this principle is so well established that the following relation between an impressed force, the mass of a body free to move without resistance (other than its inertia), and the velocity which is produced in a unit of time, has the force of a scientific axiom. This relation may be stated as follows: *The velocity produced in a body free to move without resistance in a unit of time will be directly proportional to the intensity or amount of the impressed force, and inversely proportional to the mass of the body.* In algebraic symbols, if v be the velocity, F the force, and M the mass, the relation will be expressed by the equation $v = \frac{F}{M}$. From this is determined the value of the force $F = Mv$. If the mass M be that of a given volume of some substance assumed as a standard, the unit of force may be assumed to be that force which will produce a given velocity —the unit of velocity, for instance—in a unit of time. This is an *absolute unit of force*, and serves as a universal measure. Another measure adopted is more specific, but not an invariable standard. It is, however, that in most common use, and is perhaps the most universally understood as the standard of measure for forces. If the force F, instead of being any force, be taken as the force of gravitation, the total attraction of the earth at a given place on the mass M will be what is commonly called the weight of the body; representing this by W, we shall have $W = Mv$. If the same standard mass be chosen as before, the weight of this mass may be taken as the unit of force. Such a unit has been generally adopted for different national standards. For English measures the mass M is that of a piece of platinum carefully preserved, the weight of which is called 1, or 1 lb. This weight will differ for different latitudes, because the force of attraction of the earth varies with the latitude, and hence this measure is not absolute in its character, but it is convenient for use, and is generally employed in ordinary calculations and transactions involving weight measure and the stress of materials in English measures. In electricity and magnetism the absolute unit forms the bases of computations. If any mass be allowed to fall under the influence of gravity, the velocity generated in one second may be determined experimentally, and the equation $W = Mv$ will give the relation between the weight, mass, and velocity under these circumstances. In the latitude of London this velocity is 32·2 feet approximately; so that $\frac{W}{32{\cdot}2} = M$. The mass of a body is thus found by dividing the weight by 32·2. The unit of force, for British measures, may therefore be said to be *one pound avoirdupois*, and the mass of the body may be found by dividing the weight by the number 32·2; these quantities representing British measures referred to the latitude of London. The corresponding French unit of force is 1 kilog., equivalent to about 2·2 British units.

A force being fully represented by its *magnitude*, *direction*, and *point of application*, the first problems in order in the action of impressed force relate to the laws of equilibrium, or the rules for finding the resultant of any number of forces acting on a body. If the lines of direction of the forces all pass through the same point, the resultant may be found by the application of the geometrical theorem called the parallelogram of forces. If two forces act upon one point, and portions of their lines of direction be taken to represent the magnitude of the forces, their resultant, or a single force equivalent to the action of the two, will be represented by the diagonal of the parallelogram constructed on the lines of the other two. By counting the forces which act on a point two and two, and repeating the process, a single resultant for all may be found. Or, to determine graphically the resultant, from the extremity of the line representing one of the forces draw a line parallel to the direction of any other force, of a length representing the magnitude of this force; then from the extremity of this last line draw another, parallel to and equivalent to another force, and so on; the final resultant will be a line drawn from the extremity of the last line to the origin, or point of application; if this line is zero, then the forces are in equilibrium. If the forces do not all act on one point in the body, the conditions of equilibrium require that the action of the forces shall be such that they not only produce no motion of the body in a straight line, but there must be no unbalanced effort to turn the body about any line as an axis.

The *moment of a force* in reference to an axis is the product of the intensity of the force into the perpendicular distance of its line of action from that axis.

Several special cases may be considered as leading to the most general case of the equilibrium of any number of forces acting upon a rigid body in any direction.

1. To find the resultant of two parallel forces acting in the same direction, divide any line across their common direction into parts inversely proportional to the magnitudes of the forces; the point of application of the resultant may thus be found, and its magnitude will be equal to the sum of the magnitudes of the two forces. A third force equal and opposed to this resultant will produce equilibrium.

2. The resultant of any number of parallel forces acting in one plane and in the same direction may be found by first finding the resultant of two, then the resultant of this with a third, and so on.

3. For any number of parallel forces not in one plane, the conditions of equilibrium require that the algebraic sum of the forces shall be equal to zero, and the algebraic sum of the moments of the forces in reference to any two rectangular axes in the plane; that is, the combined action of the forces must produce neither a motion of translation nor of rotation.

4. Two equal parallel and contrary forces not acting on the same point produce a couple which has no single resultant.

5. When a system of forces acts in various directions and on various points of a rigid body, if three axes be assumed at right angles to each other, each of the forces may be replaced by three component forces in the direction of these axes. The components of each force being found by multiplying the magnitude of the force by the cosine of the angle which its line of action makes with the direction of the component (a process which depends on the theorem of the parallelogram of forces), then the conditions of equilibrium of the system are that the algebraic sums of the components in the directions of the three axes shall be zero, and also the algebraic sums of the moments of the forces in reference to these axes must be zero.

The application of these principles to find the centers of

gravity of various lines, surfaces, and solids is made by supposing the body to be divided into small elementary portions, and these portions to be acted on by the parallel forces of gravity acting on each. In a corresponding manner the center of pressure of fluids resting upon surfaces may be found.

The various cases of equilibrium when no other forces act on a body than the force of gravity, and the pressure between the body and fixed supports, constitute a large class of problems which occur in the applications of dynamics to engineering; the stresses and strains which are produced in the pieces of a structure being the principal objects for calculation. In the action of forces where motion is produced, the elements of time, space, and velocity enter into the discussion, as well as the mass of the body acted on.

The three fundamental axioms or truths on which the science of dynamics principally rests are:

1. Every body continues in its state of rest or of uniform motion until compelled by impressed forces to change its state.

2. Change of motion is proportional to the resultant of the impressed forces, and takes place in the direction of the straight line in which that resultant acts.

3. There can be no action of a force without a contrary and equal reaction.

The *work* of a force is the product obtained by multiplying the intensity of the force by the space passed over by its point of application.

According to the above axioms or fundamental principles, the effort of any force must be opposed by an equal and contrary effort from some other force. In cases of bodies free to move under the influence of any force, a portion of the resistance to the external force is always supplied by the inertia of the body. If no other force acts upon the body than the force which produces the motion, the whole of the resistance will be supplied by inertia, and the expression which has been employed, $F=Mv$, gives the relation between the force and the resistance in terms of the mass and velocity. The quantity Mv, called by some writers quantity of motion, and by others momentum, may be interpreted as implying that this is *the measure of a force* which, acting for a unit of time upon the mass (M), generates the velocity v. If the force continue to act on the body so as to accelerate the velocity, the *work* of the impressed force must be equivalent to the work of the resistance during any given time or through any given space. A body moving, for instance, with a velocity v, and having by the action of an impressed force its velocity changed to v', the change of momentum will be $M.(v-v')$. The force necessary to produce this change in the time t will be $F=M.\frac{v-v'}{t}$. If during this time we suppose the body to have passed with a uniformly accelerated velocity over the space s, the *work* of the force F will be Fs. But the space s is equal to the mean velocity multiplied by the time, or equal to $\frac{v+v'}{2}t$, and we have

$$F\times s=M\frac{v-v'}{t}.\times\frac{v+v'}{2}.t=M.\left(\frac{v^2-v'^2}{2}\right).$$

If the body start from rest, the initial velocity will be 0, and we shall have

$$F\times s.=\frac{Mv'^2}{2}.$$

The same may be proved whether the impressed force is constant or variable; and the important principle is thus established that the product of the mass of a body multiplied by half the square of the velocity with which the body is moving, is equivalent to the *work* of the *impressed force* which produces this velocity in the body. And generally a change in the value of $\frac{Mv^2}{2}$ is always equivalent to the *work* of the force which produces the change. The quantity $\frac{Mv^2}{2}$ is called *living force*, and sometimes *actual energy* of the body, because a body moving with the velocity v will always require the expenditure of the work represented by $\frac{Mv^2}{2}$ to bring it to rest.

In cases where external resistances act on the body in opposition to the impressed force, the work of the resistance, added to the work of inertia, will be equivalent to the work of the impressed force. This gives rise to a very simple enumeration of the laws of all machines—viz., the work of the effort or prime mover must always, during any interval of time, be equal to the total work of the resistances added to the actual energy or living force accumulated in the moving pieces. If during a given period the living force of any piece is alternately increased and diminished, the quantities of energy stored and re-stored may just equalize each other; and such a piece may be employed simply for the purpose of storing up and restoring work, as a regulator. The common fly-wheel is such a piece in machinery.

If a body has a rotary motion about any axis, the actual energy or living force due to the rotation is expressed in terms of the angular velocity and the moment of inertia of the body with reference to the axis. If the angular velocity be represented by a, the actual energy due to rotation will be $\frac{a^2}{2g}I$; the moment of inertia I being found by means of what is called the radius of gyration, which is that radius or distance in a rotating body the square of which is the mean of the squares of the distances of the particles of the body from the axes. For the fly-wheel this radius is approximately equal to the mean radius of the rim.

When a body in motion is constrained to move in a curve, the force which causes it to deviate at each instant from the tangent is found by multiplying the mass by the square of the velocity, and dividing by the radius of curvature. The deviating force is equal and opposite to the influence which tends to draw the body away from the axis, the centrifugal force, and hence the *centrifugal* force is always proportional to the square of the velocity, and inversely as the radius of curvature.

In the application of the laws of dynamics to fluids the principle of living force holds true as for solids. Every fluid mass in motion has a living force proportional to the mass, multiplied by the square of the velocity.

The force of heat is derived from the same general dynamical law. It has been demonstrated that the molecules of all bodies have a constant vibratory motion, and these molecules having weight, the energy exerted when a body is cooled is equivalent to the expenditure or change of living force; and when a body is heated, the vibratory motion of the particles being increased in velocity, living force or actual energy is stored.

The property of matter which is called inertia, by virtue of which masses in motion possess a force which is appropriately called *living* force, is of great importance in the economy of machines, and of special importance also to living beings. In nearly all motions of animals this principle acts to aid the muscles in the execution of particular movements, which would otherwise be accomplished by fatiguing exertions, and would often be otherwise impracticable.

The demonstrations and applications of the various principles which have been enunciated, with their secondary consequences, usually occupy entire volumes. Works of this character have generally been entitled works on mechanics, and are often divided into two subjects or parts, *statics* and *dynamics*, but the tendency of modern writers is to exclude the word *mechanics* from definitions connected with *abstract* science, and to employ the term *dynamics* to designate the whole science of force. W. P. Trowbridge.

Dynamic Units: units for measuring forces and their effects. The simple *unit of force* has been defined under Dynamics. A *unit of work* combines two elements—viz., force acting, and space through which it acts; and is the product of a unit of force and a unit of distance. Such is the foot-pound, which is the work done in raising 1 lb. 1 foot; or the kilogrammètre, the work done in raising 1 kilog. 1 meter. A *unit of power*, or of *rate of working*, involves the additional consideration of time. It is a definite amount of work conventionally fixed upon for purposes of comparison as the work of a unit of time. Thus the horse-power, the unit of rate commonly used in the U. S. in estimating the performance of machines, is 550 foot-pounds per second, or 33,000 per minute. The *cheval-vapeur* (French horse-power) is 75 kilogrammètres per second, or 4,500 per minute; equal to 542½ foot-pounds per second, or 32,550 per minute, nearly—a little less than the former.

W. P. Trowbridge.

Dynamite: See Explosives.

Dynamite-gun: a gun for throwing dynamite. An experimental gun for this purpose was made in New York city and tried at Fort Hamilton in Apr., 1884. The gun consisted of a tube 40 feet long and one-eighth of an inch thick,

with a bore 4 inches in diameter, connected with a large steel cylinder supplied with compressed air by a steam-engine. The target was 8 feet by 10, 1¼ miles distant, and the projectile first used was 22 lb. in weight and loaded with sand instead of dynamite; afterward two shots were discharged loaded with fulminate of mercury. Neither of the shells exploded until it struck the earthworks, and both penetrated 4 or 5 feet into the earth. The experiment, which was conducted by Col. John Hamilton and Lieut. E. L. Zalinski, was entirely successful. On Mar. 26, 1887, a projectile of 146 lb., and containing 50 lb. of dynamite and nitro-glycerine, was discharged from a gun of 8-inch bore, thrown about a mile, and exploded under water in New York harbor. For illustration and further information, see ORDNANCE.

Dynamo-electric Machine (usually called simply dynamo): a machine for the transformation of mechanical energy into electrical energy, or *vice versa*. Machines of the latter class are usually called electric motors. Fundamentally, in a dynamo-electric machine an electric current is generated by the rotation of conductors in the presence of a magnetic field, or by the mechanical variation of magnetism embraced by electric conductors. A conductor carrying electric current in a magnetic field is acted on by a force tending to move the conductor across the field at right angles to the direction of magnetization. An electric conductor, when moved across a magnetic field, has an electromotive force produced in it that causes an electric current in the conductor in a direction opposite to the motion. Fig. 1 shows the relations of the direction of magnetic lines of force, motion of a conductor, and induced current. Fig. 2 gives one an idea of a simple dynamo. The quadrangular conductor is rotated in the field of a magnet. The right conductor of the quadrangle is moving down through the field, and has therefore an electromotive force developed in it that tends to cause a current toward the pulley, while the left conductor is moving up through the magnetic field across the lines of force in an opposite direction, and has therefore an electromotive force developed in it that will cause a current away from the pulley as indicated by the arrows. The result of the two electromotive forces is to produce a circulating current in the quadrangle. This continues while the conductors, as the quadrangle rotates, are moving across the field or "cutting lines of force"; but when the quadrangle is at right angles to the lines of force, the conductors no longer cut across the lines of force, but for the time being are moving parallel to them. At this point, therefore, no electromotive force is produced in the conductors, and the current in the quadrangle is zero. As the rotation continues, the conductors have exchanged positions in their relation to the magnetic field. The right-hand conductor in Fig. 2 is now on the left hand, and moving up across the lines of force, whereas it was going down before. This reversal of relations produces a corresponding reversal of the electromotive forces in the conductors, and therefore a reversal of the current in the quadrangle. The current then during one half of the revolution is in one direction, and in the opposite direction during the other half. By a continuous rotation we have thus produced an alternating current in the quadrangle. We may open the quadrangle at any point, and extend the ends thus produced by means of metallic conductors to two insulated metallic rings upon which press stationary insulated metallic brushes, as illustrated in Fig. 3. From these brushes insulated conducting wires may extend to any point, and there be joined through an apparatus for utilizing the electric current. If the conductor leading from the brushes be joined through a galvanometer, its needle will be deflected first in one direction and then in the other as the rotation of the quadrangle continues. By joining the ends of the quadrangle each to semicircular rings, thus forming a "two-part commutator" (see Fig. 4), the current in the circuit external to the quadrangle will always be in the same direction, but fluctuating in amount.

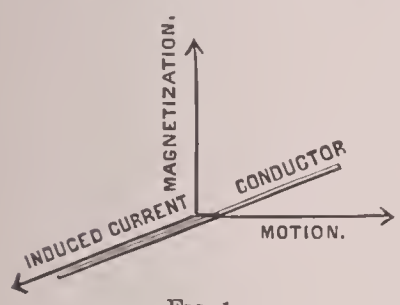


FIG. 1.

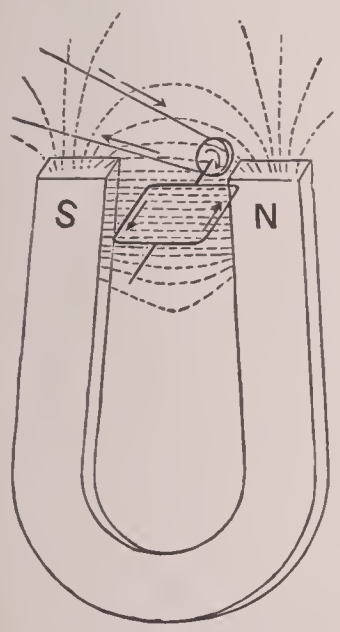


FIG. 2.

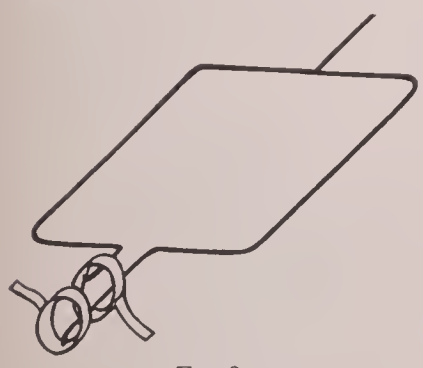


FIG. 3.

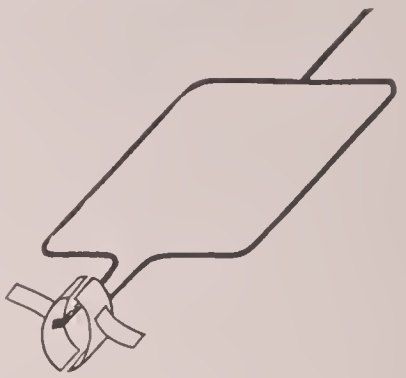


FIG. 4.

Practical dynamo-electric machines are constructed and operated on the principles just described; the field is made greater and more intense, while the two conductors forming a single turn are replaced by many turns. There are two great classes, direct-current and alternating-current generators. The former includes all dynamos for the production of electromotive force and current that are of the same sign or direction at all instants. The latter includes all machines for the production of "alternating" electromotive forces and currents that for one short interval of time exist with one sign or direction and for the next instant exist with the opposite sign or direction. Usually the electromotive forces, and therefore the currents that are induced in the active conductors, are alternating, as in the simple dynamo described above. In direct-current dynamos the two-part commutator of the simple dynamo is replaced by one of many parts; each part is connected to the end of one generating coil, or to the end of one generating coil and the beginning of the next. In alternate-current dynamos the generating coils or conductors are connected in series, and the remaining terminals are connected to rings (as in Fig. 3), when the coils instead of the magnets constitute the moving parts; and when the coils are stationary their terminals are connected to binding posts. The alternating current is taken off by means of insulated conductors from the rings or binding posts, as the case may be. In all but the smallest dynamos the electric current is used for establishing the magnetic fields in which the conductors move. This is done by encircling the magnetic circuit with numerous turns of insulated copper wire, carrying current. The product of the current in ampères into the number of turns thus applied is the number of ampère-turns. The magnetomotive force of each ampère-turn is 1·257 in centimeter-gramme-second units, so that 795·0 ampère-turns set up in air a magnetization of 1,000 lines per sq. centimeter through a distance of 1 centimeter, or 313·2 ampère-turns will set up in air 1,000 lines per sq. inch through a distance of 1 inch. Cast-iron, wrought-iron, and steel castings are used to make up the greater part of the magnetic circuit in dynamo-electric machines. For magnetic densities below 10,000 lines per sq. centimeter in cast iron and 18,000 lines per sq. centimeter in wrought-iron and steel castings the number of ampère-turns required to set up a given magnetic density through a given distance is far less than for air. Relations between the magnetic densities in lines per sq. centimeter and ampère-turns requisite to set up such magnetic densities through a distance of 1 centimeter for cast-iron, wrought-iron, and steel castings are given in the diagrams of Fig. 5.

In all dynamo-electric machinery the collection of parts in which the electrical energy is generated is called the *armature*. The collection of parts utilized in providing the magnetic field is called the *field*. In Fig. 6 the portions of the field from which the magnetism enters the armature are called the *poles*; those about which the current circulates

for setting up the magnetism are called the *field cores*; the portion that joins the field cores together at their extremities opposite the poles is called the *yoke*; the windings on the cores through which the excitation current is set up are called the *field coils*. In general the construction of the magnetic circuits of direct-current dynamos necessitates the use of laminated iron cores in the armature for the purpose of lessening the reluctance of the magnetic circuit. The lamination is accomplished by building up the cores with insulated iron disks about ·015 inch in thickness, and arranged parallel to the lines of magnetic force. Iron wire is occasionally used for building up armature cores. The lamination prevents the loss of energy that otherwise would occur through the parasitic currents that are formed in solid iron when rotated in a magnetic field. The space in

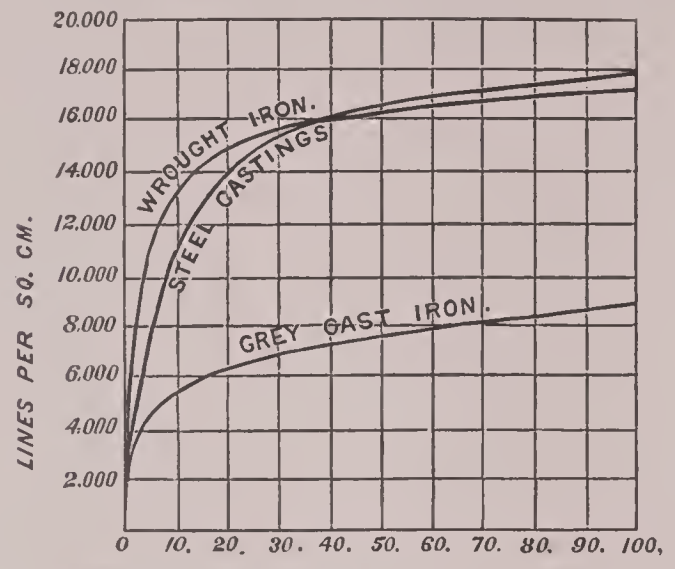


FIG. 5.

the magnetic circuit occupied by air and non-magnetic materials is called the air-gap. The distance between the surface of the armature core and that of the poles is known as one-half the depth of the air-gap. The magnetic density varies in different parts of the circuit and with different materials. Cast-iron field cores are worked at 6,000 or 7,000 lines per sq. centimeter; yokes at 5,000 lines per sq. centimeter; and poles at 3,000 lines per sq. centimeter; field cores, poles, and yokes made of wrought-iron or steel castings are worked at 14,000 to 16,000 lines, 7,000 lines, and 12,000 lines per sq. centimeter respectively. The magnetic density in the air-gap varies in different makes and sizes of machines from 3,000 to 7,000 and sometimes 10,000 lines per sq. centimeter. Two classes of iron cores are used in armatures, depending upon the method of winding the conductors. Those of the one class are solid cylinders, usually

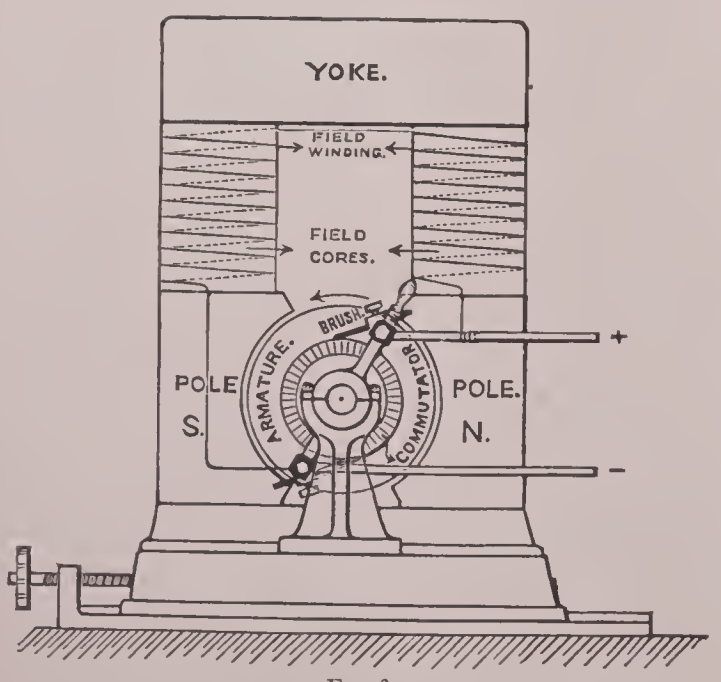


FIG. 6.

longer than their own diameter; those of the other class are hollow cylinders, generally shorter than their own diameter. The first are used in drum-armatures, and the second in Gramme ring-armatures. Disk-armatures are seldom provided with iron cores. Drum-armature cores are operated in practice at magnetic densities varying from 5,000 to 10,000 lines per sq. centimeter, while ring-armature cores at the point of maximum density are generally operated at from 12,000 to 18,000 lines per sq. centimeter. Because of the permeability of the air which everywhere surrounds the field of the dynamo, quite a considerable portion of magnetism that is set up through the yoke and field cores by the exciting coils leaks by the armature. The ratio of the magnetization through the field, M_f, to the magnetization through the armature, M_a or $\frac{M_f}{M_a}$, is the coefficient of magnetic leakage, or γ. This ratio is generally about 1·4, so that in such cases the field cores and yokes must be proportioned so as to accommodate 1·4 times the number of lines of magnetism that are needed through the armature. The following is an expression for determining the number of ampère-turns that is requisite to set up a given amount of magnetism through the armature:

$$T_wC=\frac{H_f \times L_f}{1{\cdot}257}+\frac{H_y \times L_y}{1{\cdot}257}+\frac{H_p \times L_p}{1{\cdot}257}+\frac{H_a \times L_a}{1{\cdot}257}+\frac{B_{ag} \times L_{ag}}{1{\cdot}257},$$

Where

T_wC is the number of ampère-turns,

B_{ag} the magnetic density in the air-gap,

H_f, H_y, H_p, H_a the magnetomotive forces obtained from the above diagrams for setting up through a distance of 1 cm. the corresponding magnetic densities in the field and armature cores, poles, and yoke,

L_f, L_y, L_p, L_a, and L_{ag} the distances in centimeters through which are set up the respective magnetic densities in the field cores, yoke, poles, armature core, and air-gap.

The magnetic density in any part of the magnetic circuit is $\frac{M}{S}$ where M is the total number of lines and S the cross-section in square centimeters at that point.

In the armatures of direct-current machinery, conductors, or groups of conductors, called sections or coils, have their terminals attached to insulated bars arranged cylindrically or annularly, forming the commutator. To obtain a direct current it is necessary for the armature to rotate with reference to the brushes or field, or *vice versa*. The former method is usually adopted, since in practice the brushes must occasionally be adjusted while the dynamo is in operation. With alternators either the field or armature may rotate. In direct-current dynamos there are two classes of armatures, open coil and closed coil. The latter are used much more generally than the former. In open-coil armatures there is one commutator bar for each terminal of a coil that is brought to the commutator; while in closed-coil armatures there are two coil terminals, usually the end of one coil and the beginning of the next, for every commutator bar. Figs. 7 and 8 illustrate the two methods of commutating the current. In open-coil armatures the terminals of one coil, or two or more joined in series, are connected to opposite commutator bars. While the coils are passing through the magnetic field, and are therefore active in producing an electromotive force, their commutator bars are passing under the brushes; at the same time the idle coils are cut out of the circuit altogether. This method of commutating the current has been found to be

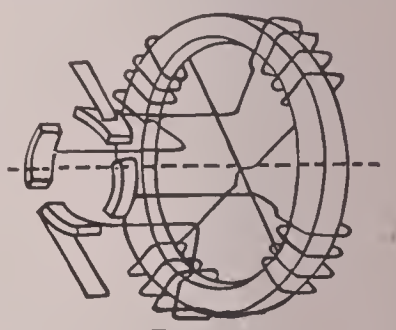


FIG. 7.

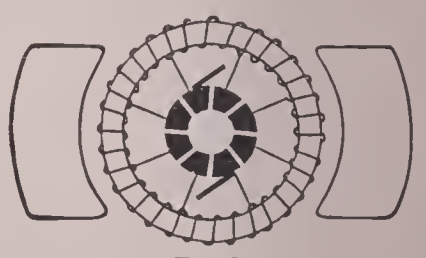


FIG. 8.

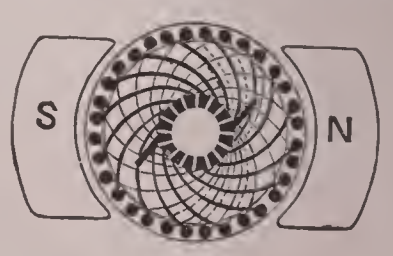


FIG. 9.

especially adapted to the generation of small currents at high voltages, such as are used for arc lighting. In the closed-coil armatures, as seen in Fig. 8, one-half of the coils or sections are constantly in multiple with the other half. Each set produces the same electromotive force as the other, which therefore is the full electromotive force of the generator, and being in multiple arc each furnishes half of the current.

Either open or closed coil armatures are still further distinguished as Gramme ring and drum armatures. In Gramme ring-armatures the core is in the form of a ring or cylinder, and the coils are wound on this core, as shown in Fig. 8. In drum-armatures the core is like a drum or solid cylinder. Fig. 9 gives a diagram of a drum-armature winding for a two-pole dynamo. The following expression is used in designing direct-current closed-coil armatures:

$$E = \frac{B_{ag} \times N_c \times L_c \times v \times \rho}{k \times 10^8},$$

Where

E = the electromotive force generated,
N_c = the number of conductors on the surface of the armature,
L_c = the length in centimeters of the portion of each conductor that is active in cutting lines of force,
v = the linear velocity in centimeters per second of the conductor,
ρ = the percentage of the armature circumference covered by the poles,
k = the number of circuits in parallel.

The maximum allowable current that an armature may furnish is limited only by the maximum heating effects that may be permitted. Heating effects in armatures are produced by hysteresis and Foucault current losses in the revolving iron cores, and by the resistance of the copper conductors. Cotton-covered, varnished wires, as used in armatures, will stand a safe allowable rise of temperature of 70° C. above ordinary temperatures. At this rise of temperature the output of an armature is generally determined. In well-made armatures 30° of this rise is produced by the heat developed in the core, and the remaining 40° by the current in the copper conductors. With this performance the cross-section of the copper conductors is generally about 450 circular mils per ampère. Direct-current dynamos are built in practice to produce either a constant electromotive force and variable current or a constant current and variable electromotive force. The former are known as *constant-potential* and the latter as *constant-current dynamos.* In all direct-current dynamos the field is produced by a current generated in the armature. In constant potential dynamos the field is wound with fine wire and the terminals are connected to the brushes at the commutator, as shown in Fig. 6. A small current is thus obtained from the armature or shunted from the main current. Such a machine is called a *shunt dynamo.* The field exciting current is varied by means of an adjustable resistance. Every variation of field current produces a corresponding variation of the amount of magnetization through the armature, and of the electromotive force generated. At a given speed the relation between the exciting current and the electromotive force generated is called the *internal characteristic* of a dynamo. The relation at a given speed between the electromotive force at the brushes and the current delivered by a dynamo is called the *external characteristic.* The diagrams in Fig. 10 give the external and internal characteristics of a shunt machine, having an output of 100 ampères at 110 volts and a speed of 1,500 revolutions per minute. These characteristics are to a dynamo what an indicator-card is to a steam-engine. They are of great assistance in determining whether the dynamo has been properly constructed, and whether it is properly operated. Frequently heavy turns of wire are wound about the field, and through these the main current produced by the armature passes; by this means more magnetization is produced through the armature as the current output increases, enabling the armature to produce a higher electromotive force to compensate for any natural falling off of the electromotive force due to the resistance of the armature, increased reluctance of the field due to the

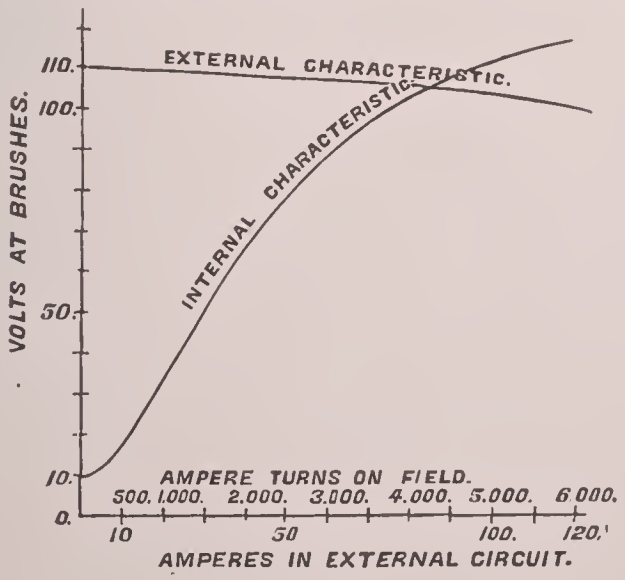


Fig. 10.

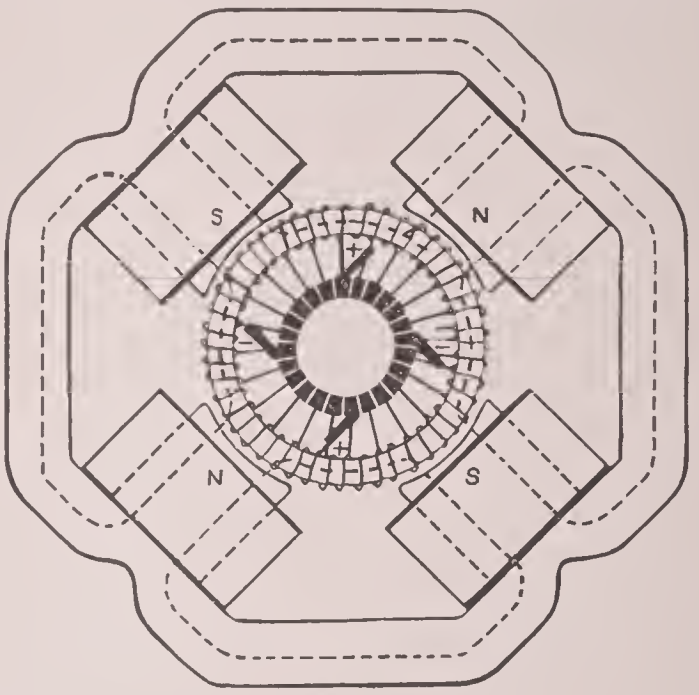


Fig. 11.

magnetic action of the current in the armature, or falling off of the speed of the prime mover. Such machines are called *compound dynamos.* Machines in which the field is produced entirely by means of turns through which the main current of the armature passes are called *series dynamos.* These are generally used for the production of a constant current and variable electromotive force. There are two methods for constant current regulation, giving rise to two classes of constant-current dynamos. In the one class the constant current produced by the armature circulates through the field for all electromotive forces, the magnetization through the armature remains constant, and the electromotive force is varied by automatically shifting the brushes at the commutator. In these machines the fall of magnetic potential between the pole faces is just equal to the magnetomotive force of the ampère-turns on the armature in the diameter occupied by the brushes. There is no magnetization in the armature along the diameter of the brushes, so that in any position the brushes are on a neutral point, and current may be taken off without sparking or disruptive effects. The electromotive force is a maximum when the brushes are at right angles to the field and coincident with the normal diameter of commutation, and it is zero when the brushes are parallel to the field or at right angles to the normal diameter of commutation. In the other class the brushes remain almost in a fixed position; the requisite variation of electromotive force is produced by varying the magnetization through the armature. This is accomplished by varying the current through the field-winding, by automatically changing the resistance of a conductor that is connected in multiple arc with it.

The fields of direct-current dynamos are distinguished by the number of their poles, as two poles, four poles, six poles, etc. Open-coil armatures are used only with two-pole fields. Armatures for the multipolar fields have hollow cylindrical cores that may have either Gramme or drum windings. In the Gramme windings for multipolar fields there are as many sets of coils in multiple with each other as there are poles, while in drum windings there are generally but two. The two styles of winding are illustrated in Figs. 11 and 12. Multipolar dynamos are usually built as shunt or compound

generators for constant potential and variable current. The multipolar forms possess certain great advantages over the bipolar forms for the large sizes of generators. Chief among these are slow speed and great output per pound of material used in construction.

Alternate-current dynamos are used extensively for electric lighting. They are generally made to develop electrical energy in the form of high alternating electromotive forces and correspondingly small currents. In this form large amounts of electrical energy may be transferred to great distances with little loss by the use of comparatively small conductors. At distant points where lights are needed the electrical energy is changed by means of a TRANSFORMER (*q. v.*), a reversed induction coil, from the form of high electromotive force and small current to that of the low electromotive force required to operate incandescent lamps, with a corresponding increase of current. Transformation by means of the induction coil can only be effected with alternate-current energy. Two succeeding alternations of electromotive force or current are known as a complete period or cycle. Alternators are generally built and operated at from 40 to 130 periods per second, and at electromotive forces from 1,000 to 10,000 volts. When higher voltages are required the alternate-current energy is developed at lower electromotive forces, and then raised by means of transformers. Alternators vary greatly in design and construction. There are two great classes—those with and those without iron cores in their armature. Fig. 13 illustrates an alternator with a revolving iron-cored armature. The armature is wound with as many coils as there are poles, and produces as many alternations per revolution as there are poles, or half as many periods. One of these alternators with ten poles making 1,200 revolutions per minute will produce, therefore, 100 periods per second. The iron cores in alternator armatures dissipate considerable energy, even when well laminated and made of the best wrought iron. It is for this reason that many alternators are built without iron armature cores. They are generally disk-like in form, and must be made as thin as possible, in order that too many ampère-turns may not be needed on the field for producing the necessary degree of magnetization through the air gap which the armature occupies. The field of alternators is usually excited by means of current generated in a small auxiliary direct-current dynamo.

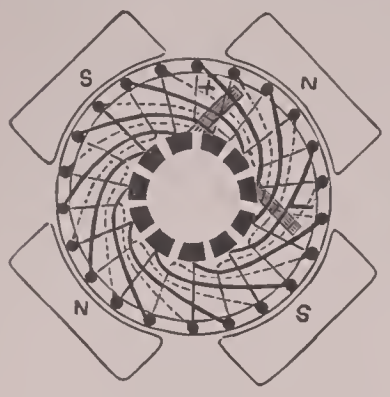


FIG. 12.

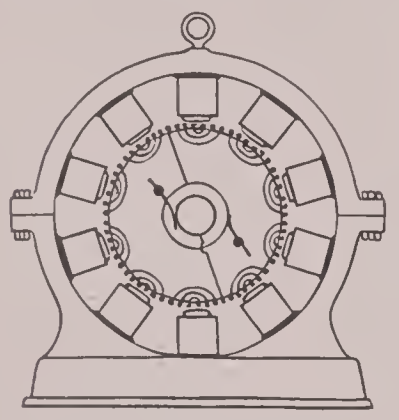


FIG. 13.

The commercial efficiency of a dynamo is the per cent. of energy given up to it in the mechanical form that is received from it in the electrical form. Well-made dynamos have a commercial efficiency of 90 per cent. American dynamos average in weight 100 lb. to the electrical horse-power output.

The following are the most important facts in connection with the history of the dynamo. Faraday in 1831 discovered the electro-dynamic induction of currents. Jacob Brett in 1848 suggested the use of the induced currents for increasing the strength of the magnets used in inducing them. Dr. Werner Siemens in 1855 developed the Siemens shuttle armature, by which greatly augmented effects were obtained. Pacinotti in 1864 gave us the first modern armature with a commutator and connected conductors, that made possible the generation of an unfluctuating current by mechanical means. Gramme in 1871 produced the ring-armature with its commutator, substantially as used to-day. In 1873 Hefner Alteneck gave us the modern drum-armature. From this time on dynamo-electric machinery has enlisted the serious thought and attention of a host of engineers, by whose combined efforts it is rapidly being brought to a high stage of development. HARRIS J. RYAN.

Dynamom'eter [from Gr. *δύναμις*, power + *μέτρον*, measure]: an instrument or apparatus for measuring energy exerted or work performed. Any contrivance may be so called which indicates the intensity of a force used to produce motion. The work done is found by multiplying the *mean* effort thus indicated into the space passed over by the point where the force is applied. A dynamometer may record only the intensities of the force, space being ascertained independently, or it may record both force and distance traversed. A spring attached to a plow-beam may, by suitable mechanism, be made to record the varying force of traction, and thus become a dynamometer. The mean force shown by it, multiplied into the length of the furrow, will give the work of the animals drawing the plow. Prony's friction dynamometer is the form most easily applied to revolving shafts. A flexible band, enveloping either the shaft or a drum turning with it, resists the driving force by its friction. The resistance is measured by a weight required to keep the band from turning with the shaft, and this weight, multiplied by the circular distance through which it would have been carried in a given time if it had revolved with the shaft, gives the work of the prime-mover. Hirn's torsion dynamometer measures the force applied to a shaft by the torsion caused by such force in the shaft itself. This dynamometer was an ingenious device, but has not been applied to any extent in practice. The torsion dynamometer and the spring dynamometer are best suited to measure variable forces, but there are instruments of this class in which force is measured by the resistance of fluids driven through small apertures. For measuring the work of fluid pressure, the steam-engine indicator is the dynamometer in common use. In this the pressure of the fluid upon a small piston is resisted by a spiral spring. A pencil which moves with the piston traces upon a moving slip of paper a curve, of which the ordinates give the pressure, while a straight line perpendicular to these shows the distance passed by the surface pressed. The mean pressure multiplied by this distance gives the work done. Transmission dynamometers are intended to measure work transmitted; as, for example, the work transmitted by belts. W. P. TROWBRIDGE.

Dyne: the absolute unit of force. (See DYNAMICS; also UNITS.) Forces are measured by means of the motion which they are capable of imparting to matter. A dyne is the force which applied to a gramme (mass) for one second of time will impart to it a velocity of 1 cm. per second. In other words, a dyne is the force which acting upon a gramme of matter gives it a unit of acceleration. The poundal, a force unit used to some extent in the British empire and in the U. S., is equal to 13,825 dynes. E. L. NICHOLS.

Dyrrachium: See DURAZZO.

Dyscra'sia [from Gr. *δυσκρασία*; *δύς*, bad + *κρᾶσις*, mixture]: in medicine, a morbid condition of the body in general, anciently thought to be due to disorders of the blood and humors of the body, whence the name. See CACHEXIA.

Dysentery [from Gr. *δυσεντερία*; *δυσ-*, ill, bad + *ἔντερα*, bowels]: a febrile disease, characterized by paroxysms of pain in the bowels, and by scanty though often frequent bloody, mucous stools. The glands and tissue of the large intestine are inflamed, and sometimes, though rarely, the small intestine shares the disorder. It may be acute or chronic, and is a frequent and formidable disease, especially in hot climates. It is sometimes epidemic, and then is peculiarly fatal among children. Many times it attacks and decimates armies. Sporadic cases in civil practice usually recover with little treatment. Pain is relieved by opium or Dover's powder. Gentle purgatives are extremely useful. Enemata of warm water will often relieve tenesmus. Astringents, ipecac, opiated starch injections, etc., are useful adjuvants in some cases.

Niemeyer regards epidemic dysentery as a disease distinct from the common or sporadic disease. He considers it truly infectious. The severer cases of this disease are not much benefited by treatment. Even the mild cases are apt to assume a chronic form, which may prove fatal. This disease is akin to cholera, and perhaps to intermittent fever. It is endemic in Southern Europe. Certain dysentery-like diarrhœas occur in Egypt, and are caused by a trematode worm (*Bilharzia hæmatobium*) in the intestinal walls. The cause of some forms of dysentery is now thought to be a form of

amœba—the *Amœba coli*. This organism presents the general appearances of ordinary water amœbæ.

Revised by WILLIAM PEPPER.

Dysmenorrhœ'a [from Gr. δυσ-, hard, ill + μήν, month + ῥοιά, flow]: painful and difficult menstruation. It may be variously caused, as (1) by flexion or displacement of the uterus, in which case the proper treatment is the restitution of that organ to its normal position; (2) by an excessively or morbidly excitable nervous condition, best relieved by sedatives at the time of attack, and by supporting treatment and correct hygienic regimen; (3) repeatedly by uterine rheumatism, in which case it may require the treatment appropriate to rheumatism; and (4) by a variety of other local troubles which may require special treatment. When associated with endocervicitis or endometritis it is often benefited by local treatment with caustics, etc.

Dyspepsia [from Gr. δύσπεπτος, hard to digest; δυσ-, hard + πεπτός, partic. of πέσσειν, soften, ripen, cook, digest]: a disordered state of the stomach, attended by a great variety of symptoms. Dyspepsia may be a purely functional disease—that is, may be unattended by any structural alteration in this organ—and such is doubtless often the case. On the other hand, the disordered state of the stomach may be the expression of true organic disease, or may be the result of disease elsewhere, affecting the stomach secondarily. The symptoms of dyspepsia are as well known as they are varied, and according as one group or another predominates, different forms of the disease have been described. The feeling of weight after eating, flatulence, heartburn, or pyrosis, coated tongue, constipation, headache, and general malaise are among the common symptoms. In some cases in which there is actually an inflamed condition of the stomach, gastritis, more or less pronounced, the discomfort after eating may be immediate, and may amount to severe pain; there is apt to be vomiting, and the tongue is heavily coated. Cases of acute gastritis are not generally reckoned with dyspepsias, but only the subacute and chronic forms. The term catarrhal dyspepsia is applied to such cases. In other cases flatulence is marked, all food rapidly undergoing fermentative decomposition with production of gases; the stomach is distended, there is great discomfort or pain, constant belching and sometimes vomiting; the pressure on the diaphragm may influence the heart and lead to palpitation or intermittent action. The term *flatulent dyspepsia* is applied to such cases. In a third group of cases the symptoms of the disease partake of a nervous character, such as headaches, depression, colicky or neuralgic pains in the stomach (gastralgia), tremulous, glazed tongue, and general nervous disturbance. The term *nervous dyspepsia* is sometimes used to designate these cases, which not infrequently belong to a class of individuals in whom there is a general disturbance of nutrition and assimilation, bearing a more or less close relation to gout, and called *lithæmia*, a condition in which nervous dyspepsia, vague rheumatoid pains, headaches, depression of spirits, with uric acid or urate deposit in the urine, play a prominent part as symptoms.

Thus it will be seen that the symptoms of dyspepsia are extremely varied, and the question of underlying cause so difficult as to tax the best skill of the physician. In all cases it is of first importance to appreciate the vice of system or of habits leading to the malady, and to eradicate this if possible. In many instances it will be found that faulty habits with reference to food lie at the root of the trouble. Improper or improperly varied food, coarse, indigestible articles, rapid eating, with insufficient mastication, bad teeth, and the like are among the causes, and require radical correction. The food should be plain and wholesome, varied to an extent from day to day, eaten slowly and well chewed. Cold water should be taken only in small amount.

In regard to medicinal treatment, the most important indication is to avoid excessive medication. At times the symptoms require palliative remedies, rarely can much permanent good be done by drugs alone. If there be much tendency to fermentation, carbolic or weak mineral acids act well by preventing the growth of the micro-organisms which cause decomposition. If the stomach be irritable, small doses of bismuth subnitrate are advisable. If constipation is marked, the food should be regulated to obviate this; but *purgative medicines must be avoided as much as possible*. When the action of the stomach seems functionally sluggish, stomachics, such as strychnia, quinine, and similar bitters may do good. Pepsin and other digestants may be needed, but are to be used sparingly.

WILLIAM PEPPER.

Dyspha'gia [from Gr. δυσ-, hard + φαγεῖν, eat]: in medicine, a difficulty in swallowing, caused by paralysis, disease of the muscles of the throat, quinsy, œsophagitis, carcinoma, stricture, or spasm of the œsophagus; or it may be a symptom of hysteria, tetanus, or hydrophobia. Its treatment is various, according to the disease of which it is a symptom.

Dyspho'nia [not from Gr. δυσφωνία, roughness of sound (δύσφωνος, ill-sounding), but, in its present meaning, to be viewed as derived from δυσ-, hard + φωνεῖν, utter sound (φωνή, sound)]: a difficulty in speaking. The most common variety is the *dysphonia clericorum*, or "clergyman's sore throat," a follicular inflammation of the pharynx, accompanied by huskiness of the voice, with more or less coughing, hawking, and expectoration. The follicles of the fauces and the pharynx are larger or more apparent than in health. The follicles occasionally discharge hard or elastic lumps of mucus, greatly to the alarm of the patient. Ulceration may supervene, and the patient may be constantly inclined to swallow. Time, rest, muscular exercise, tonics, traveling by sea or land, are all useful in the treatment.

Dyspnœ'a [Gr. δύσπνοια, difficulty in breathing; δυσ-, hard + πνεῖν, breathe]: a difficulty in breathing, a common symptom in most diseases of the heart or lungs. If the difficulty is increased by lying down, so that the patient can only breathe with any comfort when erect, it is called *orthopnœa*. Dyspnœa is sometimes the result of some functional or organic nervous disease, as hysteria. It is then relieved in most cases by diffusible stimulants. In other cases the character of the dyspnœa is remarkably varied, and the proper treatment is as various; belladonna, stramonium, cannabis, chloral, ipecac, and many other remedies are often useful. Strict temperance in eating and drinking should always be observed.

Dytis'cidæ, or **Dyticidæ** [deriv. of Mod. Lat. *Dytis'cus*, name of one of the genera, appar. for *dy'ticus* = Gr. δυτικός, able to dive; δύτης, diver, δύειν, dive]: a group or family of beetles, embracing nearly a thousand species, with broad, oval, and usually flattened bodies, and with the hinder legs flattened and furnished with hairs for swimming. The colors are usually dark (brown or black), and both larvæ and adults are found in rivers, lakes, and ponds, where they feed upon other insects, as well as on mollusks, and even small fishes. Most of the species are small, but some reach a length of nearly 2 inches. The adults are strong flyers, and frequently leave the water at night, and are attracted by electric lights. The larvæ are frequently known as "water-tigers" on account of their ferocious habits. When ready to transform they go into the pupa stage at the shore, and the adult beetles live through the winter in such situations. The adults are protected against injury by a milk-white, strongly-smelling fluid, secreted from the margins of the prothorax.

J. S. K

Dzig'getai, or **Koulan** (*Asinus onager*): a wild ass abounding in Eastern Turkey, Persia, Afghanistan, and the Punjaub. It is one of the swiftest of quadrupeds, and can not ordinarily be overtaken, even by the Arabian horse, and the greyhound can follow it successfully only on the open plains. These animals live in troops, under a leader who rules them despotically. They are extremely wild, for they are much hunted, not only for their excellent flesh, but for the great difficulty and excitement of the chase. They are pursued by means of falconry, but are more frequently shot with the rifle. They are of a brown color, with a black stripe along the back.

E

(pron. *ee*): the fifth letter and second vowel of the Roman and of most modern alphabets. The Greeks had two vowels represented by the Latin *e*—the one short (ε, *epsilon*), the other long (η, *eta*); ε stood for the number 5, η usually represented 8. The Sanskrit has only one *e*; this is always long (see SANSKRIT), and is usually represented in the Western languages by *e* circumflexed (*ê*). In the Arabic and Persian the vowel *fatha* (see ARABIAN LANGUAGE), being a somewhat obscure sound, is often represented in the European languages by *ĕ* (short), though it properly corresponds to short *ă*; thus we may write *el-Korân* or *al-Korân* for the Koran, *er-rasheed* (rashîd) or *ar-rasheed*, the surname of Harun (Haroun), the celebrated Caliph of Bagdad. In like manner, the Arabian prophet's name may be written either Mohammed or Mohammad. The Arabs have no vowel sound corresponding to long *ĕ* (*ê*), although this frequently occurs in the Persian.

In most of the modern European languages *e* occurs more frequently than any other letter. This remark is especially true of the French and English. One reason of this is that *e* (mute) in these languages usually replaces the terminal letter or letters of Latin or Greek words, as in the following nouns: *fame*, from the Latin *fama*; *muse* (Lat. *musa*; Gr. μοῦσα); *plume* (Lat. *pluma*); *bile* (Lat. *bilis*); *cone* (Lat. *conus*; Gr. κῶνος); *face* (Lat. *facies*); so also in adjectives, as *prone* (Lat. *pronus*); *pure* (Lat. *purus*); *vile* (Lat. *vilis*), etc. All the foregoing derivative words are French as well as English. In a few instances the final *e*, though found in English, is omitted in French; as *pine* (Lat. *pinus*; Fr. *pin*); *wine* (Lat. *vinum*; Fr. *vin*), etc.; but more frequently the reverse occurs, particularly in adjectives; thus we have *arid* (Lat. *aridus*; Fr. *aride*); *avid* (Lat. *avidus*; Fr. *avide*); *livid* (Lat. *lividus*; Fr. *livide*), etc. For the different sounds of *e* in English, see PRONUNCIATION.

E in music is the third note in the diatonic natural scale of C. The scale of E major has four sharps in the signature; that of E minor one sharp; and C sharp and G are their relatives, major and minor. E is the keynote of the "Phrygian" mode in the old Greek system of tonality.

Eachard, eeh'ard, JOHN, D. D.: clergyman: b. in Suffolk, England, in 1636. He became a fellow of Catherine Hall, Cambridge, in 1658, and master in 1675, in succession to Dr. John Lightfoot. He wrote *The Ground and Occasions of the Contempt of the Clergy and Religion Inquired into* (1670) and a *Dialogue on Hobbes's State of Nature* (1672). He was a writer of considerable humor, but of no great ability. D. in Oxford, July 7, 1697.

Eadie, ee'dĕe, JOHN, D. D., LL. D.: a divine of the Scottish United Presbyterian Church; b. at Alva, Stirlingshire, May 9, 1810. He graduated at the University of Glasgow, studied theology in the seminary of the United Presbyterian Church, was appointed pastor of the Cambridge Street church, Glasgow, in 1835, and in 1843 Professor of Biblical Literature in the United Secession Divinity Hall, Edinburgh, continuing to live in Glasgow. In 1863 he formed the new Lansdowne church, in Glasgow, of which he was minister until his death. Besides commentaries on the Epistles to the Ephesians (1854), Colossians (1856), Philippians (1859), Galatians (1869), Thessalonians (1877, published posthumously), two volumes of discourses—*The Divine Love* (1855) and *Paul the Preacher* (1859)—and a history of the English Bible (2 vols., 1876), he prepared a very popular condensation of Cruden's *Concordance to the Scriptures* (1830); *The Bible Cyclopædia* (1848); *The Ecclesiastical Cyclopædia* (1861), etc. D. in Glasgow, June 3, 1870. See his *Life* by James Brown (London, 1878).

Eadmer, ed'mŭr, or **Edmer**: an English historian and monk. He entered in his youth the Benedictine monastery at Canterbury, and became a friend of St. Anselm. He was elected Bishop of St. Andrews in 1120, but the Scottish king would not allow him to be consecrated by the Archbishop of Canterbury, and he soon returned to his monastery. He is one of the most important historians of the time. His works are *Historia Novorum*, in six books, giving the history of the three Archbishops of Canterbury, Lanfranc, Anselm, and Ralph, edited by Selden (London, 1623) and reprinted in Gerberon's edition of Anselm's *Works* (Paris, 1675); *Vita Anselmi*, edited by Surius (Antwerp, 1551); a letter to the monks of Glastonbury about the life of St. Dunstan, and another to the monks of Winchester about episcopal election; the *Lives* of St. Bregwin, St. Oswald, and St. Odo (see list of his works in Wharton's *Anglia Sacra*); a *Life of St. Wilfrid of York*; and some minor treatises wrongly ascribed to Anselm, all of which are found in Migne, *Patrologia*, *CLIX.* The best editions of the *Historia* and *Vita Anselmi*, by Martin Rule, are in the Rolls Series (London, 1884). D. Jan., 1124.

Eads, eedz, JAMES BUCHANAN, LL. D.: civil engineer; b. at Lawrenceburg, Ind., May 23, 1820. From childhood he was eager to learn, and showed great mechanical ingenuity. While a mere lad he built and equipped a miniature steamboat, and a few years later invented a diving-bell boat for recovering wrecks, which brought him an ample fortune. He built the first ironclad steamer used in the U. S. navy, and was instrumental in putting the first fleet of ironclads on the Mississippi (1861–62). He completed the construction of the St. Louis bridge in 1874 (see ST. LOUIS), was engaged for several years in building the jetties at the mouths of the Mississippi (see JETTIES), and in 1879 prepared plans for a ship-railway across the Isthmus of Panama (see SHIP-RAILWAY). The Albert medal was awarded to him in 1884. D. in Nassau, Bahama islands, Mar. 8, 1887.

Eagle [M. Eng. *egle* from O. Fr. *egle* (Mod. Fr. *aigle*) < Lat. *aquila*]: the popular name of several species of large rapacious birds of the order *Raptores* and family *Falconidæ*. They belong to the genera *Aquila*, *Haliaëtus*, etc., and are characterized by hooked beaks and sharp, powerful claws. About seventy species are known. They have great powers of flight and of vision, are diurnal and solitary in their habits, and use their claws in killing their prey. The eagle was regarded by the ancients as a symbol of royalty, and has the proverbial distinction of being the king of birds. Large specimens measure about 3½ feet in length, and 9 feet from tip to tip of the expanded wings. Eagles usually breed in mountainous districts or forests, remote from human habitations. They are all monogamous, and it is said that a pair will live together in perfect harmony until death separates them. They build their nests on a high tree, a ledge of rock, or on some inaccessible cliff. The nest is inartistically constructed of sticks, which are rudely arranged. The eagle is supposed to live to a great age, more than one hundred years.

The golden eagle (*Aquila chrysaëtos*) is a magnificent bird found in Europe, Asia, and North America, deriving its name from the golden-red color of the feathers which cover its head and neck. The plumage of the body is a rich dark brown. This species is the largest of the European eagles. It feeds on hares, lambs, pigs, fish, etc., which it carries to its nest. When in pursuit of its prey it is very audacious, and has been seen to carry off a hare before the noses of a pack of hounds.

It is stated that the golden eagle can be tamed, and has been trained to catch game for its master. The flight of this bird is very graceful, and presents an interesting spectacle. It sweeps through the air in a series of spiral curves, rising with every curve, and making no perceptible effort or motion with its wings. The imperial eagle (*Aquila imperialis*), which inhabits Asia and Southern Europe, is nearly as large as the golden eagle, and is similar in appearance. It may be distinguished from the other species by the white patch on its scapularies. Its head and neck are covered with feathers of a deep fawn color. It generally builds on lofty trees.

Much more common than the golden eagle is the sea-eagle (*Haliaëtus albicilla*), also called the white-tailed and the cinereous eagle, because the adults have a grayish-brown color, with pale head, yellow beak, and white tail—characters of plumage which, however, the young ones do not assume

until the third or fourth year of their age. It lives chiefly along the coasts of the sea or the banks of inland waters, as it principally feeds on fish and the refuse which may be thrown up on the shore; it takes, however, also lambs, hares, and rabbits. It sometimes builds on the ground and sometimes in a high tree, but always in a lonely and inaccessible place, on the ledge of a steep cliff or in an island in a lake. The nest is very rude, consisting merely of a mass of sticks with a hollow, lined with grass, in the center. The species is found all over the northern part of the Old World, from Ireland to Kamtchatka, and in Europe it breeds as far to the southward as the Albanian Mountains.

The national bird of the U. S. is the bald eagle (*Haliaëtus leucocephalus*), which has a white head, neck, and tail. It is said to lay its eggs in the same nest year after year. It is fond of fish, which it generally steals from the osprey. Its habit is to watch near a river or other water until an osprey has caught a fish, which the eagle snatches in the air or catches as it falls from the claws of the osprey. The bald eagle is widely distributed through different regions of North America, and frequents the seacoasts, lakes, and large rivers. It measures from 35 to 40 inches in length. See BALD EAGLE and HARPY EAGLE. Revised by F. A. LUCAS.

Eagle: a gold coin of the U. S., equivalent to $10.00. It bears the figure of an eagle, weighs 258 grains troy, and, being nine-tenths fine, contains $232\frac{2}{10}$ grains pure gold. The only larger gold-piece coined in the U. S. is the double eagle, equivalent to $20.00.

Eagle: in heraldry, a bearing of frequent occurrence, and often assumed by sovereigns as the emblem of empire, from having been borne on the legionary standard of the ancient Romans. The eagle of Russia is *or*, with two heads displayed, sable, each ducally crowned of the field; the whole imperially crowned, beaked, and membered gules. The eagle of Austria is also displayed with two heads. The Prussian eagle has only one head. The U. S. adopted (1785) the bald eagle, its wings displayed, proper, as the national emblem.

The eagle was also one of the most ancient Roman military standards. In 104 B. C. it became the distinctive ensign of the Roman legions. It was made of bronze or silver, and was carried upon a short staff. An eagle of gold was the royal emblem of ancient Persia.

Eagle-hawk: a name given to several species of birds of prey of the genus *Morphnus* and family *Falconidæ*, similar in form to the eagle, but inferior in size. They are natives of South America, the East Indies, and Africa. They have short wings and long legs. Some of them are beautiful. Like the eagles, the eagle-hawks are monogamous, and remain constant to their mates through life. Like the eagle, the eagle-hawk is assisted by his mate in hunting.

Eagle, JAMES P.: politician; b. in Maury co., Tenn., Aug. 10, 1837; removed to Arkansas in 1839, where he was brought up to farm labor. In 1861 he entered the Confederate army as a private; at the surrender of the army of Gen. Johnston he was lieutenant-colonel of Reynolds's brigade, which had been consolidated into a regiment. After the war he became a successful planter. He was ordained as a Baptist minister in 1870; attended school and college in 1870 and 1871. In 1873 he was elected to the Legislature, and three times afterward was a member of that body. In 1885 he was chosen to be Speaker of the House of Representatives; in 1888 he was elected Governor of Arkansas, and was re-elected in 1890. He is one of the vice-presidents of the Southern Baptist Convention. W. H. WHITSITT.

Eagle Pass: city; on railway; capital of Maverick co., Tex. (for location of county, see map of Texas, ref. 6–F); situated on the Rio Grande, 248 miles S. W. of Austin, in a coal-mining and stock-raising district. During the civil war it had a large trade with Mexico. Pop. (1880) 1,627; not separately given in 1890 and 1900.

Eagle-ray: a name applied to the large rays, or skates, of the family *Myliobatidæ*, or in a more restricted sense to one species, *Myliobatis aquila*, a fish of wide distribution. These rays, found in temperate or tropical waters, have the fins expanded into a pointed, wing-like shape, the teeth arranged something like a mosaic pavement to form a flat, crushing surface in each jaw, the tail long, whip-like, and armed with one or more sharp, serrated spines. F. A. LUCAS.

Eagle-wood: the fragrant wood of *Aquilaria ovata*, a tree of the family *Thymelæaceæ*, indigenous in the tropical parts of Asia. It is used for burning as incense.

Eagre [etymology unknown]: a Norse word, used to express the sudden rise of the tide in the mouth or estuary of a river. See ÆGIR and BORE.

Eakins, ee'kinz, THOMAS: genre and portrait painter; b. in Philadelphia, 1844. Student in the Pennsylvania Academy, Philadelphia, and pupil of Gérôme and Bonnat, Paris; for several years Professor of Painting at the Pennsylvania Academy. His portrait of Prof. Barker in the Art Club of Philadelphia is an excellent work; and a genre picture of serious merit, *Professionals at Rehearsal*, is in the collection of T. B. Clarke, New York. He has given great attention to photography and to the study of anatomy. It may be said of his work in general that it is more scientific than artistic. Studio in Philadelphia. W. A. C.

Eames, eemz, CHARLES: lawyer and journalist; b. at New Braintree, Mass., Mar. 20, 1812; graduated at Harvard in 1831, and studied law. In 1845 he took a situation in the navy department at Washington, and soon became an editor of the Washington *Union*. He was sent by President Polk as commissioner to the Sandwich islands, whence he returned in 1850. After several years of journalism he became U. S. minister to Venezuela under President Pierce. After his return, in 1858, he attained high reputation as an admiralty lawyer. D. in Washington, D. C., Mar. 16, 1867.

Eames, EMMA: opera-singer; b. in 1868, in China, where her parents, who were natives of Boston, were temporarily residing. She studied in Boston under local teachers, and in 1883 went to Paris and studied under Mme. Marchesi; made her *début* there at the Opéra early in 1889, in Gounod's opera *Roméo et Juliette*; in 1891 appeared in New York as one of Abbey's company at the Metropolitan Opera House, and made a brilliant success during the season, especially in *Faust*. These operas were taught to her by Gounod himself. In July 1891, she was married to Julian Story, an artist, and son of William W. Story, the sculptor. D. E. HERVEY.

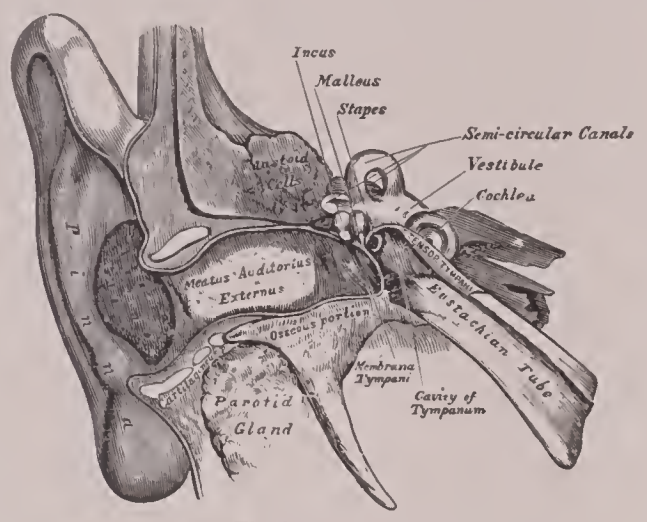
Ear: the organ of hearing. For the perception of sound the essential structure is a nerve capable of receiving and transmitting sonorous vibrations. Some animals (as spiders), possessing no special organ of hearing, nevertheless show a distinct recognition of sounds. The lowest animals, Protozoa, have no specialized organs of sensation. In some of the *Acalephæ* (belonging to the Radiata of Cuvier), as *Medusa*, small sacs arranged around the margin of the disk appear to represent the ear in a rudimentary form. Many of the Mollusca have auditory organs. In Gasteropoda (e. g. snails) these are connected with the pedal ganglia, seeming thus to aid directly in the guidance of locomotion. Cephalopoda, the highest of the Mollusca, have the organs of hearing connected with the head, as they are in Vertebrata. Worms also often have auditory vesicles in the head, connected with the œsophageal nervous ring. Grasshoppers and locusts have similar organs, either at the sides of the first abdominal segment or on the main segments of the anterior legs. In the lobster and other large Crustacea they are placed in the basal joints of the first pair of antennæ. Probably they have a similar situation in some insects, which appear to find each other by hearing sounds made especially by those of the male sex.

All vertebrate animals, except *Amphioxus*, have distinct organs of hearing. They differ much, however, in the different classes. Fishes have no external or middle ear, and no cochlea in the internal ear. Amphibia also are without a cochlea; some have a tympanum, others none. Reptiles, except the crocodile, are quite destitute of external ears. All of them, except serpents, have a tympanum, and several an externally visible membrana tympani. The columella in them is either one small bone or a row of bones in the tympanic cavity. It is homologous with the stapes or stirrup-bone of mammals. Comparative anatomists generally consider the other tympanic bones (incus and malleus) to be homologous with the "quadrate" and "jugal" bones, which support the jaws in birds, reptiles, and fishes; being thus, in all of these animals, outside of the ear. Some anatomists, however, assert the existence within the tympanum of reptiles of a rudimentary incus and a cartilaginous malleus. No *external* ear exists in any fish or reptile. Birds, especially owls, present it in the form of a circular arrangement of feathers. In birds the middle ear (tympanum) contains only a single bone, the columella, with processes of cartilage representing the other bones. The cochlea of the internal ear is, in birds, a conical, slightly twisted double canal; the semicircular canals in them are large.

Mammals always have the internal and middle ear complete, and mostly also an external ear. This is slight, however, in diving quadrupeds, as the otter and beaver, and wanting altogether in the whale, seal, mole, ornithorhynchus, and armadillo. Several aquatic animals have a valve near the entrance of the external meatus or canal of the outer ear, which closes when they are under water, protecting the membrana tympani against excessive pressure. The elephant also is provided with a sort of valve or ear-flap. Bats are endowed with very large and sensitive external ears. Many quadrupeds (e. g. the horse and dog) have considerable muscular power over their ears, by which they can turn them so as to receive sound from different directions. Man has three *rudimentary* muscles of the same kind, but they are commonly powerless and without use.

The Human Ear.—This consists of three distinct though connected parts—the *external ear*, the *middle ear* or tympanum, and the *internal ear* or labyrinth.

Of the *outer ear*, the expanded part is the pinna; its prominent rim or margin is the helix. The ridge next within this is called the anti-helix: it divides above. Its lower and front part encircles a cavity, the concha, below

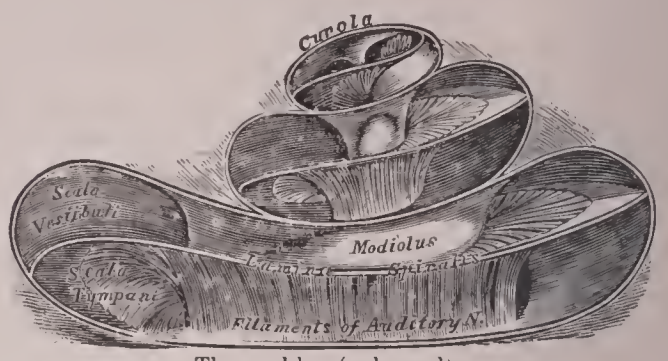


The human ear.

which are two opposite prominences, tragus and anti-tragus. The lower, soft, flexible part is the lobule. The whole external ear, except the lobule (which is formed of fat and connective tissue), is composed of cartilage covered with skin, well supplied, however, with nerves as well as blood-vessels. The entrance to the ear is the meatus auditorius externus. It is about 1¼ inches long, directed forward and inward, slightly curved. Near its orifice are the ceruminous glands, secreting the ear-wax. At the bottom of the meatus is the membrana tympani.

The middle ear or tympanum is a sort of drum or hollow organ, containing air, and through its middle a small chain of bones—the malleus or hammer bone, the incus or anvil, and the stapes or stirrup. The tympanum communicates with the throat (pharynx) by means of the Eustachian tube. The fenestra ovalis, or oval window of the tympanum, is a membranous partition between the internal part of the tympanic cavity and the vestibule of the labyrinth or internal ear. The fenestra rotunda is a round, membranous "window" between the tympanum and the cochlea of the labyrinth. Three muscles are asserted by most anatomists to exist in the tympanum—the tensor, tympani, laxator tympani, and stapedius. The second of these is considered by some to be only a ligament. An important part of the middle ear, in grown children and adults, is the mastoid process. It contains the mastoid cells, which communicate with the tympanum.

The internal ear is composed of the vestibule, cochlea, and three semicircular canals. The vestibule is the middle portion, the cochlea is anterior, and the three canals are above and behind the vestibule. Within the latter are two small bodies, the otoliths, or ear-stones, composed of carbonate and phosphate of lime. The semicircular canals always differ definitely in their direction, two being vertical and one horizontal. The cochlea is shaped somewhat like a snail shell. In its center is a conical bony axis, the modiolus. Around this is a spiral canal, within which is the lamina spiralis, partly composed of bone and partly membranous. This divides the canal into two passages or scalæ —the upper communicating with the vestibule, scala vestibuli, and the lower communicating through the fenestra rotunda with the tympanum, scala tympani. The bony part of the lamina spiralis has a grooved margin, the uppermost edge of which, toward the scala vestibuli, supports a finely toothed membrane, lamina denticulata. From each



The cochlea (enlarged).

of these margins of the lamina spiralis is given off a fine periosteal layer—the upper one of the membrane of Corti, the lower the basilar layer. Between these is a space called by Kolliker the scala media. Within this space are arranged two sets of minute, rod-like bodies, parallel to each other, radiating from the axis of the cochlea, those of the two sets being inclined toward each other above. These are the rods of Corti. Looked at in a certain direction with the aid of a lens, they resemble somewhat the keys of a piano.

The whole inner surface of the bone labyrinth is lined by a fibro-serous periosteal tissue. This secretes a thin fluid, the perilymph. The membranous inner labyrinth, which duplicates, as it were, the osseous wall of the vestibule and semicircular canals, secretes a similar liquid, the endolymph. The auditory nerve (portio mollis of the "seventh pair" of cephalic nerves, according to anatomists) is subdivided into branches, which are distributed to all the parts of the internal ear. Those filaments which enter the cochlea form a sort of ganglionic plexus in the scala tympani: thence proceed some very delicate nervous extremities which in the scala media are brought into relation with the rods of Corti, and probably also with certain large nucleated cells in their vicinity called the cells of Claudius. For physiology of auditory apparatus, see Acoustics. See also *Treatise on the Ear*, by D. B. St. John Roosa (New York, 1866).

D. B. St. John Roosa.

Ear, Diseases of the: Foreign bodies frequently become lodged in the auditory canal, as when children put beads, buttons, or other small objects into the ear, or when it is entered by insects. The canal is also sometimes obstructed by cerumen, or ear-wax, which may accumulate in great quantities, so as to occupy and occlude the passage and exclude sounds. It may press on the membrana tympani (drumhead), the membrane separating the external canal of the ear from the tympanum. It is a most frequent cause of deafness. Cerumen is to be removed by the surgeon by the ear-syringe and warm water. A solution of bicarbonate of soda (1 drachm of soda to 6 oz. of water), used for a few hours before, will greatly assist in the removal. The auditory canal is frequently the seat of little abscesses, or "boils in the ear." They are painful, though not dangerous, but their presence generally indicates a low condition of the general system. For a time they occlude the passage and cause impairment of hearing, which subsides with the pain when the abscesses discharge. The treatment should be warm poultices and fomentations to the region of the ear, leeching in severe cases, and free use of hot water by means of the fountain syringe, until the boils discharge. Incisions are sometimes necessary. The membrana tympani or drumhead of the ear may be injured by the introduction of sharp instruments, or ruptured by sudden impaction of air, compressing it from without, as by a box on the ear, the noise of a loud explosion, as of blasting, cannon, or even firearms. It may also be ruptured by air from the throat, through the Eustachian tube, suddenly and forcibly pressing from within, as in violent blowing of the nose, vomiting, and paroxysms of whooping cough. Such ruptures usually heal. Ulcerative perforations may be minute, or include nearly the whole membrane. Often, if the Eustachian tube be not closed, a person can blow air from the throat through the perforated drum into the external, auditory canal with a perceptible sound. An artificial drumhead or membrana tympani of hard rubber can be worn with benefit in a limited number of cases. A pellet of moistened cotton wool introduced each day in a measure effects the same result.

The chief inflammations of the ear are those that extend from the throat and nose by the Eustachian tube to the tympanum. They may be catarrhal or go on to become purulent. In the latter case the pus usually breaks through the drumhead and causes a discharge of pus to appear in the external canal of the ear (Otorrhœa). The catarrhal form is best treated by the hot douche to the auditory canal, and if this does not suffice the pain may be relieved by leeches. When the pain has subsided, inflation of the tympanum by Politzer's method should be practiced daily until the hearing is restored. The purulent form is to be treated by constant removal of the pus, by syringing with hot water, and also by inflation of the tympanum. The auditory nerve is sometimes the seat of disease as a result of cerebral inflammations, tumors, or the like. Inflammations, tumors and hæmorrhages, syphilis, as well as the excessive use of quinine in large doses, salicylic acid, wintergreen, may also produce disease of the acoustic nerve. Persons in middle and advanced life sometimes suffer from impairment of hearing, which is probably due to shriveling or dryness of the tissues. This form has been called *presbykousis* (Roosa). There may be a neuralgia of the ear with no apparent lesions resulting from decayed teeth or malaria, but it is rare. Most of the painful affections of the ear are inflammatory in character. Diseases of the middle ear may be readily differentiated from those of the nerve or brain by the use of the tuning-fork C. When such a vibrating tuning-fork is placed in front of the external canal of the ear, if there be disease of the nerve it is heard longer and louder than when placed upon the mastoid process behind the ear. In diseases of the nerve, the patients, like persons with normal hearing, hear better in a quiet place. Those who have disease of the tympanum or middle ear hear better in a noise. Sometimes the catarrhal or purulent inflammation of the tympanum extends to the mastoid cells. Should this occur this part of the ear becomes very painful and tender. If not very speedily relieved by the use of leeches or poultices, a surgical operation for opening the mastoid cells will be required. D. B. St. John Roosa.

Earl [M. Eng. *erl* < O. Eng. *eorl*: O. Norse *earl*, *jarl*, chief, nobleman: O. Sax. *erl*, warrior]: a British title of nobility, next in rank to a marquis, and one degree higher than a viscount. It was formerly the highest rank of hereditary nobility of England. Under the Saxon dynasty the earls were those nobles who directed the affairs of the shires. By the time of Edward the Confessor they had acquired so great power as to imperil the royal authority, the whole kingdom being divided among five earls. After the Norman conquest the title of earl was used by the English to express the French *comte*, count (Lat. *comes*). Hence the wife of an earl is still styled a countess. In the reign of Edward III. earldoms were granted by letters-patent to earls and their heirs. Earldoms were gradually converted from territorial into merely titular honors. In Great Britain an earl marshal is an officer who takes charge of important ceremonial matters, is the head of the Heralds' College, and appoints the officers at arms. The office is hereditary in the Howard family and is held by the Duke of Norfolk.

Earl, Robert, LL. D.: jurist; b. at Herkimer, N. Y., Sept. 10, 1824; educated at Herkimer Academy and Union College; county judge and surrogate of Herkimer County 1856–60; judge of the court of appeals in New York State since 1870; the term to expire by limitation of age Jan. 1, 1895. He has twice served as chief justice.

Earle, John: clergyman and author; b. in York, England, in 1601. He was educated at Oxford; became tutor to Prince Charles, and accompanied him in his exile. After the Restoration he was made successively Dean of Westminster (1660), Bishop of Worcester (1662), and Bishop of Salisbury (1663). His best known work is *Microcosmographie* (1628), one of the class of "character" books popular in the seventeenth century; best edition by Bliss (London, 1811; reprint, 1868). D. in Oxford, Nov. 17, 1665.

Earle, John: See the Appendix.

Earle, Parker: horticulturist; b. in Mt. Holly, Vt., Aug. 8, 1831; resided in Illinois, where he was a trustee of the State University, and then removed to Mississippi. He had charge of the horticultural interests at the World's Exposition at New Orleans in 1884, and since 1885 has been president of the American Horticultural Society.

Earle, Pliny: physician; b. at Leicester, Mass., Dec. 31, 1809; a son of Pliny Earle, the inventor; educated at the Friends' School at Providence, R. I., and graduated as M. D. at the University of Pennsylvania in 1837. He was resident physician of the asylum for the insane at Frankfort, near Philadelphia, 1840–42; physician to the Bloomingdale asylum, New York, 1844–49; became Professor of Materia Medica and Psychology in the Berkshire Medical Institution at Pittsfield, Mass., in 1863, and was superintendent of the Massachusetts State Hospital for the Insane 1864–85. In the years 1837–39, 1849, and 1871 he traveled in Europe, visiting the most prominent institutions for the insane. He published many reports, articles in periodicals, etc., and is author of *Marathon, and other Poems* (1841); *Institutions for the Insane in Prussia, Germany, and Austria* (1853); *An Examination of the Practice of Blood-letting in Mental Disorders* (1854). D. in Northampton, Mass., May 18, 1892.

Earlham College: a co-educational institution of learning; situated at Richmond, Ind.; chartered in 1859; has five buildings, with attractive grounds, large and well-equipped chemical and biological laboratories, an extensive museum containing exceptionally valuable collections in geology, mineralogy, palæontology, anatomy, botany, and archæology, and libraries aggregating 35,000 volumes. There are eight courses of study of four years each, and a department of fine arts. The faculty numbers fifteen. The standard of admission and of graduation is high. The college owns 120 acres of land adjoining the city of Richmond.

Earlville; city and railway junction; La Salle co., Ill. (for location of county, see map of Illinois, ref. 3–E); 72 miles W. by S. of Chicago; has a good school, and is the center of an agricultural and stock-raising district. Pop. (1880) 963; (1890) 1,058; (1900) 1,122.

Editor of "Leader."

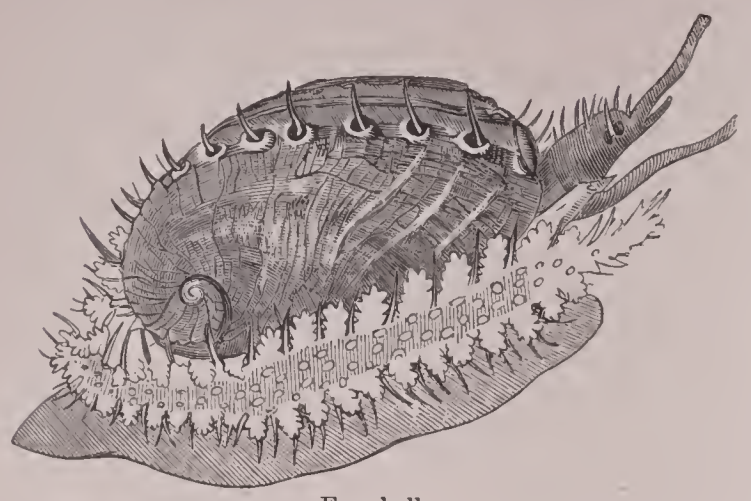
Early, John, D. D.: bishop of the Methodist Episcopal Church South; b. in Bedford co., Va., Jan. 1, 1786; joined the Virginia Methodist conference in 1807; one of the chief founders of Randolph-Macon College, Va., and a laborious and eminently successful preacher of Methodism in his native and adjacent States. He took a prominent part in the proceedings which in 1844 divided his denomination into Northern and Southern sections; was first book-agent of the Southern division, and in 1854 was ordained as one of its bishops. D. in Lynchburg, Va., Nov. 5, 1873.

Early, Jubal Anderson: general and lawyer; b. in Franklin co., Va., Nov. 3, 1816; graduated at West Point in 1837. He afterward studied law, and served in the Mexican war as a major. He joined the Confederate army, was a major-general at Gettysburg in July, 1863, and commanded an army which invaded Maryland in July, 1864. He was defeated by Gen. Sheridan near Winchester, and at Fisher's Hill in Virginia, on Sept. 19 and 20. On Oct. 19, 1864, he attacked the Union army at Cedar Creek, Va., in the absence of Gen. Sheridan, who arrived in time to rally his retreating army and to gain a decisive victory. After the war he returned to the practice of law in Richmond, Va., and later resided alternately at New Orleans and Lynchburg. Author of the pamphlet *A Memoir of the Last Year of the War for Independence in the Confederate States* (Lynchburg, 1867). D. at Lynchburg, Va., Mar. 2, 1894.

Earn: popular name of a genus of eagles. See Erne.

Earnest, or **Arles**, or **Erles** [M. Eng. *ernes*, history obscure, but probably the same word with *arles*, *erles* < O. Fr. *erres*, *arrhes*: Ital. *arra*: Span. *arras*, money paid at purchase, probably of Semitic origin. The Eng. forms *ernes*, *earnest* are probably due to false associations with nouns in *-ness*, and finally with subst. and adjec. *earnest* (= Germ. *ernst*), as if implying that the bargain were in earnest]: the giving of money, or a commodity, or a delivery of a part of any goods sold, to "bind a bargain," i. e. to mark the conclusive assent of both parties to the bargain. In some countries the same object is accomplished by the performance of what are now meaningless ceremonies as a pledge of good faith. The effect of giving earnest is to make the contract binding, and, in the case of the sale of a specific chattel, to vest the property in the vendee. Neither party can rescind the contract without default by the other, but the seller is not obliged to deliver the goods till the whole price is paid; and if the buyer fails to demand and pay for the goods, the seller, after due notice, can sell again and keep his earnest. The giving earnest is now fallen into disuse, and is important chiefly because it is one method by which a contract may be made valid under the Statute of Frauds. Revised by F. Sturges Allen.

Ear-shell: the shell of various marine gasteropods of the family *Haliotidæ*; found principally in warm regions.



Ear-shell.

The flesh, though tough, is edible. The shells are used by savage races for money and ornaments, by civilized man for various kinds of ornamental work, and by the Japanese and Chinese they are largely employed for inlaying lacquer ware. On the Pacific coast of the U. S. the shells of the *Haliotis* are known as *abalones*, and there is an extensive fishery, chiefly carried on by Chinese, for the shells and the flesh, which is salted, dried, and exported. The genera and species, living and fossil, of this family are numerous and widely distributed. F. A. Lucas.

Earth, The: a planet of the solar system, the third in order of position. As the dwelling-place of man it is the subject of his most attentive study, which study constitutes the science of geography. (See Geography.) It may be considered in its relations to other globes, and in itself. Viewing it as an individual, we may give attention to its form and dimensions, its mass, its densities, its temperatures, its composition, its physical constitution, its magnetism, its envelopes. its inhabitants, and the history of its evolution.

1. *The Earth in relation to the Universe and the Solar System.*—As a star the earth belongs to the non-luminous group. It shines only by reflected light, and would be invisible to eyes like our own looking from any star more distant than the planet Jupiter.

As a planet the earth belongs to the inner group of four, its orbit lying without those of Venus and Mercury and within that of Mars. (See Solar System.) Its two principal motions are rotation about an axis and revolution about the sun. Its period of rotation, known as the sidereal day, is 23 hours 56 min. and 4·1 sec. Its period of revolution, known as the sidereal year, is 365 days 6 hours 9 min. and 9·3 sec. (See Day and Year.) The axis of rotation is not vertical to the plane in which the orbit of revolution lies, but is inclined from the vertical at an angle of 23° 27½′. This angle is subject to a small and very slow variation, ranging from 22° 22½′ to 25° 33½′. The direction toward which the axis inclines is likewise continuously changed, sweeping through a complete circle in about 2,600 years. This movement is analogous to that of an inclined top, which, while swiftly spinning, moves its axis slowly about an imaginary line rising vertically from its point of support. (See Precession of the Equinoxes.) Upon this motion is superposed a smaller, known as the nutation of the earth's axis. These axial movements are caused by the attractions of various heavenly bodies acting on the protuberance of matter about the earth's equator. A third small movement differs from the others in that the relation of the axis to the earth is changed, while its relation to the plane of the earth's orbit is unaffected.

The orbit of the earth is an ellipse so nearly circular that its longer and shorter diameters differ only in the ratio of 60 to 59. The sun, being at one of the foci of the ellipse, is at a distance from its center equal to the 119th part of the diameter. The least distance of the earth from the sun, at perihelion, is 91,200,000; its greatest distance, at aphelion, is 94,400,000 miles; its mean distance is 92,800,000 miles. All these elements, except the mean distance, are subject to gradual but great variations, and the position of perihelion slowly revolves about the sun, consuming in a complete cycle more than 100,000 years. The mean velocity of the earth in its journey around the sun is 1,108 miles per minute, or 18½ miles per second. The velocity with which an object on the equator rotates about the axis is 17·3 miles per minute, or 1,520 feet per second. The earth's mass is the 327,000th part of the sun's, and is eighty-one times that of the moon.

The moon revolves about the earth in a slightly elliptic orbit at a distance of 238,850 miles, or about 30 terrestrial diameters. Its period of revolution is 27 days 7¾ hours; its synodical period, or the mean interval between conjunctions with the sun, is 29 days 12¾ hours. See Moon.

The solar system is separated by an immense interspace from all other visible stars, and between its members there subsist numerous orderly relations pointing to community of origin. The planes of the orbits of the eight planets coincide nearly with the medial plane of the solar system (the "invariable" plane), the most aberrant being inclined but 7°. The average inclination of the orbit planes of the 280 determined asteroids is 8°, and that of the most aberrant is 35°. All these bodies revolve about the sun in the same direction, and so do 16 of the 21 discovered satellites. The only bodies constituting exceptions to the general rule are the four satellites of Uranus, whose orbits incline about 90°, and the satellite of Neptune, whose motion is retrograde. The directions of rotation have been determined for the sun, the moon, and four of the planets, and these directions not only agree with one another, but they coincide with the direction of orbital revolution. These elements of order, to which may be added an approximate harmony in the series of intervals between planets, compel the belief that the assemblage of bodies is not fortuitous, and render plausible the hypothesis of Laplace, that all were evolved by the gradual condensation of an immense, rotating, nebulous mass. (See Nebular Hypothesis.) This condensation is supposed to have left each globe highly charged with heat, which is being gradually dissipated by radiation, and accordingly the sun, the greatest body of all, is now intensely hot; traces of heat are believed to have been detected in the light of the greatest planet, Jupiter; no such traces are afforded by the smaller planets; and the earth, which we can examine more thoroughly, is found to have an internal store of heat. Accepting this hypothesis as more probable than any other, we are enabled to reason in regard to the early history of our globe before the beginning of the long series of superficial changes constituting the field of geologic research.

2. *General Form and Dimensions.*—The earth is a globe with a diameter of about 8,000 miles. Its form approximates closely to an exact sphere, but is slightly flattened on two sides, so that its diameter from one of those sides to the other is about 27 miles less than in a direction at right angles to this. In technical terms, and more precisely, its figure is an oblate spheroid of revolution, with a mean diameter of 7,917·5 miles, and a flattening of $\frac{1}{295}$. The shortest diameter coincides in position with the axis of rotation, and the longest diameter passes from any point of the equator to the opposite point. Theoretically, a globe of any mobile material poised motionless in space and held together by the mutual attraction of its particles should assume a spherical form. If endowed with a motion of rotation, the parts remote from the axis of rotation should tend to fly off from the axis, and this tendency, combined with gravitational attraction, should give to the mass the form of an oblate spheroid similar to that of the earth. The dimensions of the terrestrial spheroid, as determined by measurement (see Geodesy), coincide closely with those theoretically deduced from the relation of its velocity of rotation to gravitative force.

Dimensions of the Earth.

	Miles.		Miles.
Mean radius.....	3,958·8	Mean diameter.....	7,917·5
Equatorial radius...	3,963·3	Equatorial diameter.	7,926·5
Polar radius	3.949·9	Polar diameter.....	7,899·7
Difference.....	13·4	Difference.....	26·8

Equatorial circumference.....	24,902	miles.
Meridional circumference.....	24,860	"
Difference.....	42	"
Area of the surface.....	196,940,000	sq. miles.
Volume.....	260,000,000,000	cubic miles.

These quantities are based on the spheroid deduced by A. R. Clarke, and published in 1866, the spheroid adopted by most great surveys.

The preceding statements ignore the details of the earth's surface, such as mountains, continents, ocean beds, and apply to an ideal spheroid whose surface coincides almost precisely with the surface of the ocean, and with the level

160 120 West 80 Longitude 40 from Greenwich

80

ARCTIC OCEAN

NORTH AMERICA

40

PACIFIC

0

SOUTH AMERICA

ATLANTIC OCEAN

A

OCEAN

40

THE EARTH

Showing height of land and depth of Sea,
on the Mercator projection,
by G.K. Gilbert.
Based chiefly on compilations by
J.G. Bartholomew (1886, 1887, 1892),
U.S. Hydrographic office (1888) and
Henry Gannett (1892).

ANTARCTIC

80

83 West 43 Longitude from 3 Washington 37 East

Depth of Sea

East 40 80 120 160 60

ARCTIC OCEAN

EURASIA

AFRICA

INDIAN OCEAN

AUSTRALIA

CONTINENT

40

0

40

80

Explanation
olors and Contours

of

18000 Feet
12000 „
6000 „
Sea Level
6000 Feet
12000 „
18000 „
24000 „

Drawn and Engraved on Copper-Plate Expressly for UNIVERSAL CYCLOPÆDIA.

117 157 163 West 123

extension of that surface beneath the land. A level surface is ordinarily conceived as plane, but it really represents a certain equilibrium of attractive and rotational forces, and is always curved. As the surface of the earth is rugose, and as the bodies of rock immediately beneath the surface vary in density, and therefore in attraction, the level surface has local irregularities, undulating gently in every part. When account is taken of these undulations the level surface is called a geoid, to distinguish it from the ideal terrestrial spheroid to which it approximates.

3. *Circles and Zones.*—Upon any globe representing the earth there is drawn for convenience a system of conventional lines. The two points at which the axis intersects the surface are called respectively the north pole and south pole; a circle midway between them is called the equator. A series of circles parallel to the equator and systematically disposed on either side are called parallels. They are used to indicate distances from the equator. The equator divides the spherical surface into two equal parts; the parallels divide it into unequal parts. Another series of lines called meridians pass from pole to pole, intersecting the equator and each parallel at right angles. These are equally spaced about the equator, and at the equator are parallel with one another, but they gradually converge toward the poles. The portion of a meridian included between the equator and either pole is the fourth part of a circle, and it is divided after the manner of circular arcs into degrees. Distances from the equator northward or southward are reckoned in degrees, minutes, and seconds, and are called latitude. The parallels are drawn to facilitate their estimation. The equator and parallels, all being circles, are likewise divided into degrees, and distances upon them are reckoned eastward and westward from a selected meridian known as the initial meridian. Such distances, given in terms of arc, are known as longitude. The position of any point on the surface of the globe is accurately indicated by recording its latitude and longitude, which are called its geographic coordinates. Upon maps other than globes, as, for example, those which accompany this article, lines are drawn representing meridians and parallels, and these lines constitute a framework to which all other parts of the map are adjusted. They are collectively called the projection of the map. See DEGREES OF LATITUDE AND LONGITUDE and MAP.

In addition to the parallels of the projection, which are drawn at equal intervals, four parallels are drawn on maps to indicate the limits of certain zones. The arctic circle is a parallel at a distance of 23° 27½′ from the north pole, the antarctic circle is at the same distance from the south pole, and these two are known as the polar circles. The tropic of Cancer is a parallel at a distance of 23° 27½′ N. of the equator, and the tropic of Capricorn lies at the same distance S. of the equator. The areas included by the arctic and antarctic circles are called respectively the *north frigid zone* and *south frigid zone.* The area between the arctic circle and the tropic of Cancer is called the *north temperate zone*, and the corresponding area of the southern hemisphere is the *south temperate zone.* The area between the two tropics is the *torrid zone.* The positions of the polar and tropical circles depend on the relation of the earth's axis of rotation to the plane of the earth's orbit, and they are intimately connected with the variations in the length of the day and with the cycle of the seasons. If the earth's axis were perpendicular to the plane in which it travels about the sun, the sun's apparent course as seen by an observer on the equator would be invariable and would pass through the zenith each day. Its apparent course as seen by an observer at either pole would each day follow the horizon about its complete circle. As the axis is inclined from the vertical, each pole in alternation is turned somewhat toward the sun, and each hemisphere in alternation receives a greater amount of light and heat. When the north pole is turned toward the sun to its extreme amount the hypothetic observer at the north pole sees the sun more than 23° above the horizon during the entire day of twenty-four hours, and to every observer within the arctic circle the sun is also visible during the entire day. At the same time the sun is invisible to all observers within the antarctic circle. To an observer on the equator the sun at midday appears 23° N. of the zenith, and to an observer on the tropic of Cancer the sun at midday appears in the zenith. To all observers in the north temperate zone the apparent course of the sun is higher than at other seasons, and it is visible for more than twelve hours; to all observers in the south temperate zone the apparent course of the sun is relatively low, and it is visible less than twelve hours. Six months later, when the opposite pole is inclined toward the sun, all these various relations and conditions are reversed. During the period of greater illumination of the northern hemisphere a correspondingly greater amount of heat is received from the sun, and summer is the result; on the opposite hemisphere winter is experienced at the same time, and the succeeding winter of the northern hemisphere corresponds to summer in the southern.

Each point of the earth's surface receives light and heat from the sun for the same aggregate period during each year, viz., for half of the whole period, but the total amount of heat received nevertheless varies from place to place. This variation depends upon the angle of incidence of the sun's rays. When the sun is in the zenith a bundle of rays having a cross section of a square mile is received by a square mile of the earth's surface. When the sun is low in the sky a bundle of rays of the same size is distributed over several square miles of surface, and the heat received by each unit of surface is correspondingly less. This difference, which makes the middle of each day warmer than the morning or evening, also makes the equatorial region of the earth warmer than the polar regions. There is a gradual increase in solar heat from the poles to the equator, and this increase is reflected in the general distribution of climates over the globe. As a whole, the torrid zone has warmer climates than the temperate zones, and the temperate zones are warmer than the frigid. The local climate of each district is affected also by other conditions, such as its altitude, the proximity of forests, mountains, sandy deserts, areas, large bodies of water, or the character of the country from which the prevailing winds blow. Thus the climate of oceanic islands is tempered by the air from the surrounding water, the changes of temperature in which are gradual and slight comparatively to those of the land. For particulars as to the climate of special localities, see the article CLIMATE.

The area of each polar zone is 8,204,000 sq. miles; of each temperate zone, 51,215,000 sq. miles; and of the torrid zone, 78,102,000 sq. miles.

4. *General Constitution.*—The visible portion of the main body of the earth is solid, consisting of rocks of various kinds. These rocks are arranged more or less regularly in layers and other definite units, and from a study of their mode of arrangement, as exhibited at the surface and in mines and wells, valuable inferences have been drawn with reference to the general composition and structure of the earth for a distance of several miles downward from the surface. To this outer portion, concerning which much is known either directly or through legitimate inference, the term crust is ordinarily applied, and the greater mass lying within the crust is called the nucleus. No definite lower limit is assigned to the crust, and the term is variously made to include thicknesses from 5 or 10 miles to 50 or 100 miles. It can be defined only as the outer portion, in distinction from the nucleus or inner portion. Outside the crust are two envelopes, the one aqueous, gathered in the hollows of the surface, the other gaseous, and surrounding the entire globe with nearly equable distribution.

5. *Composition of the Crust.*—If the earth were once in a molten condition, as indicated by the nebular hypothesis, its original crust was formed by the congelation of the outer molten layer. If any portion of such original crust remains at the surface it has undergone such modification by subsequent action that it can not now be identified. The visible rocks result immediately from other processes. In large part they are formed from the consolidation of sediments gathered in ancient oceans; in other part they are derived from the congelation of lavas extruded through the sediments and spread on the surface; in other part they are formed by the alteration through various physical and chemical processes of sedimentary and igneous rocks. They exhibit great variety in composition and texture as well as in their structural relations, and from their study has been deduced a history of the transformations of the surface, going back through an immense period of time. (See GEOLOGY.) Notwithstanding their variety, it has been found possible, by combining the results of a great number of chemical analyses, to reach a fairly trustworthy estimate of the average composition of the crust. From the combination and study of 880 analyses, F. W. Clarke finds that oxygen constitutes nearly one-half of the crust, silicon, the metallic base of quartz, a little more than one-fourth, and that the metals aluminum, iron, calcium, magnesium, potassium, and sodium are of importance in the order named.

The precise percentages deduced by him are contained in the following table:

ELEMENTARY CONSTITUENTS OF THE EARTH'S CRUST.

	Per cent.		Per cent.
Oxygen	47·29	Hydrogen	0·21
Silicon	27·21	Phosphorus	0·10
Aluminum	7·81	Manganese	0·08
Iron	5·46	Sulphur	0·03+
Calcium	3·77	Barium	0·03
Magnesium	2·68	Chlorine	0·01
Potassium	2·40	Chromium	0·01
Sodium	2·36		
Titanium	0·33	Total	100·00
Carbon	0·22		

6. *Internal Temperatures.*—Each day while the sun shines all parts of the surface acquire heat from the solar rays. At all times, both day and night, heat is radiated from the surface outward. As a result of this unequal heating and more equable cooling the surfaces of rock and soil grow warmer during the day and grow cooler during the night. Similarly the soil is gradually heated during summer and is gradually cooled during winter. These variations of the surface are communicated downward, but with diminishing amount, so that at a short distance beneath the surface they cease to be perceptible. The diurnal changes affect but a few feet of soil or rock; the annual changes a few scores of feet. Beneath the zone of annual change a constant temperature is found, and this constant temperature coincides closely with the mean annual temperature of the air immediately above. It varies therefore with the local climate, and is higher in equatorial regions than in polar. Passing further downward by means of an artificial excavation, such as a mine or artesian well, a gradual change is found, the temperature of the rock increasing more or less uniformly with the depth. The rate of increase varies in different places, ranging from one degree Fahrenheit for each 150 feet of descent to one degree Fahrenheit for each 30 feet. The general or normal rate is perhaps one degree in 75 feet. The water which rises from deep artesian wells retains the temperature of its source, and is invariably warmer than the ordinary spring water of the locality.

Similar evidence as to internal temperature is afforded by springs. If in any district the average temperature of springs issuing from the rock is compared with the mean annual temperature of the air, it is found to be somewhat higher; and wherever the relation of the spring to the rock structure indicates that the water has risen from a considerable depth beneath the surface, its temperature is notably high, so that the spring is classed as thermal. Other evidence of the same tenor is afforded by volcanoes, which bring to the surface from unknown depths not only steam, requiring for its production a temperature of 212° F., but molten rock with temperature of 2,000° and upward.

These facts show not only that the interior of the earth has a higher temperature than the exterior, but they show that there is a movement of heat from the interior to the surface, whence it is dissipated by radiation. It is a law of physics that where two bodies in contact have different temperatures, heat flows from the warmer to the cooler, and this flow continues until they have the same temperature. The progressively higher temperatures found at progressively greater depths from the surface demonstrate that there is an upward flow of heat. Heat is also brought to the surface by the subterranean flow of water. The water of each thermal spring was originally derived from rain, and penetrated the earth at localities remote from its point of issue. As it entered the earth it had the temperature normal to the surface at the locality. In its subterranean course it received heat from the rocks, and its acquired heat was conveyed to the surface. Similarly the heat of lavas, derived from the terrestrial store, is brought to the surface and there dissipated by radiation. All the phenomena of wells, thermal springs, and volcanoes, are phenomena of the terrestrial crust. They tell us nothing directly of the temperature of the nucleus, but they are in full accord with that portion of the Laplacian hypothesis which supposes that the whole body of the earth was originally intensely hot, and that the lost portion of the original store of heat has been gradually dissipated at the surface. It may plausibly be assumed that the temperature continues to increase downward for an indefinite distance, the rate of increase gradually diminishing; but any more definite hypothesis with reference to the distribution of internal heat must be based upon special postulates as to the molecular condition of the nucleus and the molecular changes accompanying gradual refrigeration. We are, moreover, profoundly ignorant as to the laws affecting the rate of movement of heat in bodies subjected to temperatures and pressures far beyond those which can be reproduced in our laboratories. See REFRIGERATION OF THE EARTH.

7. *Density and Mass.*—The density of a body is the ratio of its weight or mass to that of an equal volume of water. The data of astronomy, in conjunction with the laws of gravitation, give the proportion of the mass of the earth to the masses of the sun and the principal planets, and thus the determination of the absolute mass of the earth will determine the absolute masses of the sun and planets, and then their density can be found. The densities of the more important kinds of rock range from 2·3 to 3·1, and the mean density of the visible portion of the crust, as determined from many samples of rock, is approximately 2·7. As all substances are more or less compressible, we must suppose that the lower parts of the crust and all parts of the nucleus, being pressed upon by the weight of overlying portions, are compressed into less space and therefore have greater density than the superficial portions. The conclusion thus indicated by theoretical considerations has been amply sustained by the results of measurement. The subject has been approached in various ways, depending for the most part on the comparison of the earth's attraction with the attraction exerted by some smaller body of known mass. In the earlier experiments the mass used for comparison was that of a mountain or hill whose form was carefully measured, and whose density was determined by weighing numerous samples of rock. By means of astronomic observations the direction assumed by the plumb line was ascertained on each side of the eminence, and their convergence was determined. It was assumed that in the absence of the mountain they would converge so as to meet at the center of the earth, but that they would be drawn together by the mountain's attraction so as to converge toward a point nearer to the surface, and from the observed convergence it was found possible to compute the relative attractive force of the mountain and the earth and thence to deduce the mass of the earth. In 1778 Maskelyne and Hutton, from observations at Mt. Schiehallion, in Scotland, deduced 4·5 as the mean density of the earth. Subsequent determinations of the mass of the mountain and recomputations based on these gave to Playfair and Hutton severally the densities 4·7 and 5·0. Similar observations at a hill near Edinburgh, known as Arthur's Seat, afforded James and Clarke the estimate 5·3; and Peehmann, from observations in the Alps, deduced 5·4.

A second method of determination depended on pendulum observations. One of the factors determining the time in which a pendulum completes its oscillation is the force of gravitation, and when the same pendulum is swung successively at different localities the comparison of its oscillation periods affords a delicate indication of the relative values of the attractive force at the localities. As the force with which bodies are attracted toward the earth varies with reference to their distance from the center of the earth, it was thought that the comparison of the oscillation periods of the pendulum at the top of a mountain and at its base, or at the entrance of a mine and at its bottom, might afford a valuable estimate of the earth's mass and density, provided due account were taken of the masses and distances of mountains and other superficial bodies in the immediate vicinity of the pendulum stations. Observations of this character have been made by Carlini in the Alps, by Bouguer and La Condamine in Peru, by Airy at a colliery in England, by Mendenhall at the peak of Fujisan, in Japan, and by Sterneck in the mines of Bohemia, the results for the density varying from 4·39 (Carlini) to 6·57 (Airy). In 1889 Wilsing made an important variation in the pendulum experiment by substituting for change of position an artificial change in local attraction. He employed for this purpose a large mass of iron, which he placed successively in various positions with reference to a pendulum. The density computed by him was 5·58.

All experiments involving the weights of mountains are to a certain extent unsatisfactory, first, because it is difficult to deduce from superficial observations a close approximation to the weight of a mountain; and, second, because there is reason to suspect that the portions of the earth's crust immediately beneath mountains have less density than the portions beneath deep valleys. As early as 1798 an experiment was devised by Cavendish which obviates this objection. A slender wooden rod, having a small lead ball attached to each end, was suspended in a glazed box by

means of a delicate wire, an apparatus constituting the torsion balance of Coulomb. In a position of rest the rod hangs lower than in any other position, and the tendency of gravitation is to maintain that position; but the extent to which the rod is lifted by a small rotation is so slight that it is possible to induce rotation by means of the attraction of bodies exceedingly small as compared with the earth. Cavendish used two large balls of lead, which he caused to approach the opposite ends of the balance from opposite sides. From the resulting deflection he deduced a terrestrial density of 5·5. Subsequently various students repeated his observations with more refined apparatus, obtaining for the earth's density the values 5·48 (Reich), 5·58 (Reich), 5·67 (Baily), 5·56 (Cornu and Baille). An analogous experiment by Poynting substituted for the torsion balance a delicate beam scale and yielded an estimate of 5·7. An experiment by von Jolly depended, like the pendulum experiments, upon the variation of gravity with distance from the earth. With a beam scale he first compared two balls of mercury in the usual way, and then compared them again with one resting in the scale pan and the other suspended about 70 feet beneath. His result for the density was 5·7.

Considering the variety of methods by which the subject has been approached, and the vast disparity in size between the earth and the various bodies with which it has been compared, the resulting estimates are wonderfully accordant. The results which command the greatest confidence are those obtained by the method of Cavendish with the aid of more refined apparatus, and those obtained by Wilsing. The final determination of Reich, 5·58, that of Cornu and Baille, 5·56, that of Baily as corrected by Cornu and Baille, 5·56, and that of Wilsing, 5·58, give as a mean 5·57, and this may be regarded as a more accurate determination of the earth's mean density than it is possible to make of the mean density of any mountain mass, or of the earth's crust as a whole. The combination of the mean density with the volume, as given above, yields as the total mass of the earth 6,660,000,000,000,000,000,000 tons of 2,000 lb. each.

The mean density of the earth being 5·57 and the superficial density but 2·7, it is manifest that the central density is considerably greater than the mean, but the vertical distribution of densities is not equally clear. We have learned little of the compressibility of rocks, and we are wholly ignorant of their compressibility at high temperatures. It is quite conceivable that the nucleus is constituted of materials like those of the crust, and that their great density is due purely to condensation under pressure. It is equally conceivable that the tendency toward condensation due to pressure is in the main counterbalanced by the tendency toward expansion due to heat, and that the nucleal density of the earth arises from the presence of substances specifically heavy. It has been suggested by some that the oxygen of the earth occurs only or chiefly near the surface, and that the nucleus consists largely of metals in an unoxidized condition. If the nucleus contains a series of different substances arranged in the order of their specific gravities, then the downward succession of densities may be characterized by a series of abrupt steps, concerning which it is vain to speculate. If, on the other hand, the densities are due primarily to compression, then their sequence should conform to some continuous law. Such a law, suggested by the astronomer Laplace, is that the downward increment of density varies as the square root of the increment of pressure. Postulating this law and assuming the superficial density of the earth to be 2·75 and its mean density to be 5·50, Mr. R. S. Woodward has computed the quantities of the table given in the next column.

DENSITY, GRAVITY, AND PRESSURE AT VARIOUS DEPTHS WITHIN THE EARTH, ACCORDING TO THE LAW POSTULATED BY LAPLACE.

Depth in miles.	Density.	Gravity.	Pressure in atmospheres.	Depth in miles.	Density.	Gravity.	Pressure in atmospheres.
0	2·75	1·0000	1	500	4·18	1·0379	256,000
5	2·76	1·0006	2,020	610	4·50	*1·0392	354,000
10	2·78	1·0012	4,200	1,000	5·63	1·0225	672,000
15	2·79	1·0018	6,390	2,000	8·28	0·8312	1,700,000
20	2·81	1·0024	8,600	3,000	10·12	0·4567	2,640,000
50	2·89	1·0060	22,000	3,959	10·74	0·0000	3,000,000
100	3·03	1·0116	45,300				

* This is the maximum value. At the corresponding depth, 610 miles, a given mass would have the greatest weight.

In the great surveys of Europe, India, and the United States, measurements of high precision have been carried by the method of triangulation over broad areas. Through these measurements it has been possible to compare with one another astronomic observations made at many points, and one of the results of these comparisons is the knowledge of the fact, which has been previously mentioned, that the geoid deviates at nearly all points from the form of the theoretic spheroid. In other words, it is found that the plumb line at a majority of localities is not strictly normal to the general spheroid, but inclines toward one side or another. This is found to be the case not only in the vicinity of mountains, where exceptional attractive masses are visible, but also upon plains, where it must be assumed that the deviations of the plumb line are caused by local variations in the density of the crust. From a study of these variations, and from a co-ordinate study of pendulum observations, it has been determined, first, that the crust of the earth is conspicuously heterogeneous as regards density, varying rapidly and irregularly; and, second, that in a general way those portions of the crust beneath continents and plateaus are less dense than the portions beneath oceans. A conclusion of the same character is reached from the study of the general distribution of land and water. As geographers usually divide the earth into two hemispheres, eastern and western, the eastern contains much more land than the western; or if it be divided into northern and southern hemispheres, then the greater amount of land is found in the northern. The inequality may be rendered still more striking by a division into hemispheres such that England shall occupy the center of one and a point near New Zealand the center of the other. As thus divided, 45 per cent. of the former hemisphere consists of land, and only 11 per cent. of the latter. (See figure.) If the highest lands lay in the hemisphere having the smaller land area, and if the deepest oceans lay in the hemisphere having the smaller water area, these facts might compensate for the inequality in areas; but the actual condition is just the reverse. In the hemisphere with the greater area of land the height of the land is nearly one-fifth greater than in the water hemisphere; in the area characterized by the greater extent of water the depth of the water is nearly one-third greater than in the land hemisphere. The mobility of the water enables it to move freely in any direction, and we must assume that its position on the surface of the globe is determined by the

WATER HEMISPHERE

LAND HEMISPHERE

earth's attraction; nevertheless we find that more than half the total volume of water is gathered in one hemisphere, and that the hemisphere containing the greatest continental masses fails to draw to it a due share of the water. There can be little doubt that the excess of attractive force on the oceanic side of the earth is due to exceptionally high density in portions of the crust or nucleus on that side.

8. *Condition of the Nucleus.*—One of the most difficult inquiries affecting the earth's nucleus relates to the question whether it is liquid or solid. Early in the progress of geologic inquiry facts indicating its liquidity were discovered, and their sufficiency was not questioned. Afterward, however, other facts discovered in the progress of physical and astronomical science were found to indicate solidity, and the question is still involved in serious doubt. The considerations favoring the theory of liquidity are as follows: 1. The rate of increase of temperature downward, if continued, gives at a distance of but a few miles a sufficient heat to liquefy all known rocks. 2. The rocks which issue from volcanoes are actually liquid, and have temperatures commensurate with those deduced from the progressive increase found in wells and mines. 3. Rocks brought to the surface by denudation in various regions are crumpled and intricately folded, as though kneaded while in a plastic condition. 4. From time to time in the geologic history of the crust not only broad tracts but narrow belts of the crust have risen, while others adjacent to them have gone down —changes which appear difficult of explanation unless the crust rests on a soft substratum.

The first consideration adduced by the opponents of the theory of liquidity is that most substances, and probably all of the ordinary rocks, expand in passing from the solid to the liquid condition and contract in congelation. For this reason liquefaction is opposed by pressure, and a much higher temperature is necessary to melt a rock subjected to great pressure. The fact that subterranean substances are hot does not, therefore, of itself demonstrate that they are liquid. It must be shown in addition that their heat is sufficient to overcome the restraining tendency of the pressure to which they are subjected. In the second place, it is pointed out that volcanoes not only erupt lava but also cease eruption, and it is argued that, if the lava erupted were part of a molten nucleus, the conditions necessary to the production of an eruption should also suffice for its continuance. It is also pointed out that eruptions at neighboring vents do not exhibit such harmony of action as might be expected if they communicated with the same body of molten material. Eruptions at different points in a volcanic district are neither simultaneous nor alternate, but appear altogether independent.

The precession of the equinoxes, as fully explained in the article under that title, is due to a twisting of the earth by attractions of other bodies acting on that portion in equatorial regions which projects beyond the surface of the sphere to which the earth's figure approximates. The twisting is opposed by the inertia of rotation, or the tendency of every rotating body—such, for example, as a top or a gyroscope—to resist the deflection of its axis of rotation. (See GYROSCOPE.) The observed amount of precession seems to imply all the resistance which can be ascribed to the earth's mass, whereas, if a liquid spherical nucleus were surrounded by a solid crust, resistance would be afforded only by the crust. The earth thus seems to behave as a rigid and therefore solid body. This argument, originally advanced by Hopkins, has been much discussed by physicists, and its force has been somewhat weakened by considerations subsequently adduced by Hennessey and Thompson. An argument in favor of rigidity has also been drawn from the phenomena of tides. These depend on the inequality of attractions exerted by the moon and sun on the parts of the earth nearest and most remote from them, which inequalities tend to produce a small distortion of the globe. Doubtless some distortion is produced in the earth, but a greater distortion is produced in its aqueous envelope, and the difference between the two finds expression in the oceanic tides. If the earth, or all of it excepting a thin crust, were liquid, it would respond freely to the deforming force, and there would be no discrepancy between its tide and that of the aqueous envelope. It has therefore been argued that the earth either is a rigid body or else has a rigid crust of great thickness.

The apparent conflict between the geologic data and the data connected with the attractions of celestial bodies has probably depended in part upon the difficulty which the mind experiences in passing from the consideration of small bodies and small amounts of force to the consideration of large bodies subjected to correspondingly great stresses and strains. In relation to such forces as we apply in the arts, the rocks of the earth are exceedingly rigid, resisting great stresses and fracturing in a brittle manner when their resistance is overcome; but when masses and forces are considered of the magnitude of those with which terrestrial physics deals, all rocks are properly regarded as viscous, behaving in a manner quite analogous to those of such plastic substances as wax and clay. At a depth of 2 or 3 miles beneath the surface it is quite possible that rocks may be molded into new shapes, not only without fracture, but even without losing the strength which they exhibit at the surface. But while this and other considerations may contribute to a conception of possible physical conditions and possible physical processes in the earth's interior, the problem of the actual conditions and processes remains an interesting and important field of investigation.

9. *Magnetism of the Earth.*—It is the property of magnets that, when brought near together, they tend to assume certain definite directions with reference to one another. Whenever a magnet at a distance from others is suspended in such manner that it is free to turn, it is found to assume a definite direction with reference to the earth, and the earth is thus shown to be a magnet. By means of the compass, a slender magnet so suspended as to rotate freely in a horizontal plane, the horizontal direction of the earth's magnetic force has been observed in all regions, to the great advantage of the mariner. By means of the dip needle, a magnet so suspended as to rotate in a vertical plane, observations have been made of the deviation of the magnetic direction from the horizontal. Through these observations it has been ascertained that the north pole of the earth-magnet is not at the pole of rotation, but lies about 17° distant, in the archipelago N. of British America; that the south magnetic pole is equally distant from the south pole of rotation, and that the local directions of magnetic force intersect the meridians of longitude at angles which vary from place to place and from time to time. See MAGNETISM, TERRESTRIAL.

10. *Configuration of the Surface.*—In comparison with the earth as a whole, the irregularities of its surface are small; if proportionately represented on a globe 15 feet in diameter, the highest mountain would project but the eighth part of an inch above the lowest plain. But upon the scale of nature, and when viewed with reference to the activities of man, they are of signal importance. The geographer refers all inequalities to the level of the surface of the ocean, expressing their vertical dimensions as heights above and depths below that surface. Above that surface spring a number of broad, low swells, called continents; below it are sunk still broader areas called ocean beds. The surfaces of the continents are diversified here and there by projecting peaks and mountain ranges, between and about which lie valleys, basins, and plains. The ocean beds are similarly diversified, but their features have a different nomenclature. The lowest hollows are known as deeps, prominences approaching the surface are called shoals, and eminences rising above the surface constitute islands.

To the origin of the greater inequalities of surface, those of continental and oceanic magnitude, science has yet obtained no clew, and no meaning has been discovered in the form and arrangement of the continental protuberances. It is evident that the outlines of the continents themselves depend not only upon the configuration of the surface, but also upon the volume of the water by which that surface is partially covered. If the earth had less water, or if it had more, some other contour of its surface would be followed by the coast line, and the forms of the areas would be very different. Little importance is therefore to be attached to the conclusions of those who seek to discover homologies of earth structure by studying the outlines of land areas and comparing them with triangles and other geometrical figures. On the accompanying map contours are drawn upon land areas and ocean beds at vertical intervals of 6,000 feet, and the areas comprised between each pair of adjacent contours are differently shaded. Each of these contours shows approximately the form which would be given to the coast if the volume of water in the ocean were either increased or diminished so that its surface stood at the corresponding level. Collectively, they show the distribution of the greater prominences and hollows of the

earth's surface. It will be observed that not only the highest mountains but the greatest expanse of upland occur in the Himalaya district of Southern Asia, and that the greatest of the ocean-deeps lies at the southern extremity of the South Atlantic Ocean. Giving consideration to the contour at 3,000 feet above the ocean-level, we see that the principal plateaus and uplands of the land surface are arranged in a long line beginning with the southern extremity of South America, following the western coast of the two Americas to Alaska, crossing Asia from Eastern Siberia to Arabia, with a great expanse in the Tibetan region, and continuing through Eastern Africa to its southern extremity. A branch of minor importance runs from Western Asia along the shores of the Mediterranean to the Atlantic, and a broad outlier occupies the island of Greenland. Giving attention to the line of 3,000 fathoms, or 18,000 feet below sea-level, we see that the areas of great depression do not constitute a linear series, but are distributed irregularly through the North Atlantic and South Atlantic Oceans and the western portion of the Pacific Ocean.

The following tables are based upon computations by John Murray of the areas of the earth's surface lying above and below various contours:

RELATIVE AREAS OF THE EARTH'S SURFACE LYING ABOVE AND BELOW CERTAIN LEVELS.

CONTOURS.	Per cent. of surface above.	Per cent. of surface below.
Contour 24,000 feet above sea-level	0·004	99·996
" 18,000 " " "	0·09	99·91
" 12,000 " " "	0·7	99·3
" 6,000 " " "	2·3	97·7
Sea-level	27·7	72·3
Contour 6,000 feet below sea-level	42·5	57·5
" 12,000 " " "	57·3	42·7
" 18,000 " " "	96·8	3·2
" 24,000 " " "	99·93	0·07

PERCENTAGES OF THE EARTH'S SURFACE LYING BETWEEN CERTAIN LEVELS.

	Per cent.
More than 6,000 feet above sea-level	2·3
Between sea-level and 6,000 feet above	25·5
" " " " below	14·8
" 6,000 and 12,000 feet below sea-level	14·8
" 12,000 and 18,000 " " "	39·4
More than 18,000 feet below sea-level	3·2
Total	100·0

It appears from the first table that the contour which divides the surface into two equal parts falls between 6,000 and 12,000 feet below sea-level, and the figures indicate 9,000 feet as its approximate depth. From the second table and from the map we learn that the earth's surface, if divested of its aqueous envelope, would present as its great features two systems of broad plateaus, differing in height by about 18,000 feet, the upper comprising one-fourth and the lower two-fifths of the entire superficies.

11. *Features of the Land.*—Topographic features considered chiefly with reference to slope and contour are plains, plateaus or table-lands, mountains, ridges, hills, valleys, basins, cañons, etc. Features specially relating to bodies of water are islands, peninsulas, isthmuses, and coasts. These various features are of such importance in their relation to man, and as subjects of physiographic study, that separate articles are assigned to them. Their discussion is therefore omitted at this place, and the reader is referred to the general article on PHYSIOGRAPHY and the special articles entitled BASIN, CAÑON, COAST, CONTINENT, DESERTS, GLACIERS, GORGE, ISLAND, MOUNTAIN, PLAIN, PLATEAU, PRAIRIE, VALLEY, VOLCANO, etc. See also the articles on the various political divisions of the world.

12. *The Aqueous Envelope.*—In mass the water of the earth's surface is $\frac{1}{4300}$ of the globe. If it were evenly distributed it would have a uniform depth of about 9,000 feet. Gathered as it is into the hollows of the surface, it leaves a fourth part bare, and its chief body, the sea, has a mean depth of 12,500 feet. Its minor bodies, the lakes, although exceedingly numerous, contain relatively but a very small portion of the whole mass of water, and constitute but a small fraction of the aqueous surface. The water is characterized by two great systems of circulation which have a profound influence on the configuration and character of the surface of the land and on the distribution of climates. From the surfaces of water bodies moisture is lifted into the air to be subsequently discharged as rain and snow upon the land. A portion of the rain water soaks into the surface, where it occasions a series of processes resulting in the decay of rocks and the formation of soil. The remainder flowing over the surface carries with it particles of the soil, and gathering into rivulets and rivers returns to the sea where its load of detritus is deposited. Through this circulation the land is sculptured and is rendered fertile. The second circulation is oceanic, depending partly on the heat acquired by water in the torrid zone and partly on the friction of winds, and through it there is a constant transportation of heat from equatorial to temperate and polar regions, whereby extremes of climate are mitigated and the habitability of the globe is increased. The ocean is also swayed to and fro, as the earth turns on its axis, by inequalities in lunar and solar attraction.

As a constituent of all organic tissues, water is an essential condition of animal and vegetable life. As the abode of innumerable species its natural bodies constitute for man a vast storehouse of food. As a solvent of almost universal range, it is one of the indispensable materials of the arts of man in all stages of culture. It is at once the most serious obstacle to and the most economic avenue for that commercial interchange which makes the natural wealth of every district contribute to the general prosperity of all nations. Through the power of falling water and of expanding steam it is the medium for the transmutation of solar energy into the leisure and comfort on which human progress depends. In these and countless other ways it is so intimately associated with the activities of man that its full discussion in this place would unduly expand the present article. The reader is referred to the articles FLOODS, GULF STREAM, LAKES, OCEAN, RIVERS, SPRINGS, TIDES, and WATER.

13. *The Gaseous Envelope.*—The atmosphere is inferior in mass to the ocean in the ratio of 1 to 300, but in volume it is far superior. Its upper limit has not been ascertained, but has certainly a height greater than 100 miles. The density of each layer depends on the weight and pressure of all layers above. At sea-level a pound of air occupies about 19 cubic yards; in rising to 18,000 feet altitude half the atmosphere is passed, and at that height a pound of air occupies 38 cubic yards. Through its complex circulation under the influence of solar heat, the atmosphere conveys the moisture which fertilizes the land, and it is a principal factor in the determination of climates. The study of its properties and functions constitutes the science of meteorology. See ATMOSPHERE, BAROMETER, CLIMATE, METEOROLOGY, RAIN, WEATHER, and WINDS.

14. *The History of the Earth.*—The rate at which the earth's internal heat is being dissipated indicates that at a remote epoch its surface was molten. Its history previous to the formation of a solid crust belongs to the astronomer. The present condition of the crust shows that it has undergone many changes; the discovery of the nature and sequence of these changes is the chief task of the geologist. Plants and animals, whose existence was first possible after the consolidation and cooling of the crust, have undergone a long series of changes, and the history of these is the theme of the palæontologist. Finally man appeared, at first recording that intellectual development by which he is distinguished only in the implements of primitive arts, but eventually preparing and preserving a written account of his progress. See ARCHÆOLOGY, ASTRONOMY, GEOLOGY, HISTORY, NEBULAR HYPOTHESIS, PALÆONTOLOGY, and SOLAR SYSTEM. For population of the earth, see POPULATION.

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Earth-closet: a form of close-stool, designed to take the place, to some extent, of the water-closet, and frequently made portable for convenience. It is well known that dry soils have wonderful disinfecting powers, owing to their property of absorbing ammonia and other gases. It is upon this absorbing quality that the usefulness of manures, when applied to soil, depends. Advantage is taken of this absorption in the construction of the earth-closet. The fæces are covered by a small quantity of thoroughly dried soil or peat, which completely absorbs all unpleasant and injurious vapors, and after a time the mass becomes perfectly inodorous. It is found that the same earth may, if necessary, be used over and over again, and that finally, when it has become thoroughly charged with excrementitious principles, it is one of the best forms of concentrated fertilizing material known. Owing to the expense of supplying fresh earth and removing that which has become foul, the earth-closet has not been able to compete with the water-closet, except in country houses, where it may often be used with advantage.

Revised by MANSFIELD MERRIMAN.

Earth-currents: See MAGNETISM, TERRESTRIAL.

Earthenware: collectively, vessels or objects made of earth and afterward baked. See POTTERY.

Earth-nut: a popular name given to the tubers or subterranean stems of several plants—viz., the *Bunium flexuosum*, an umbelliferous plant which grows in Europe; the *Cyperus rotundus*, a native of Egypt; and the *Arachis hypogæa*, a leguminous plant often called *peanut* or *goober*. The tubers of the *Bunium*, which resemble chestnuts, and are sometimes called *earth-chestnuts*, are extensively used for food.

Earthquakes: tremors or shakings of the ground, naturally produced. An earthquake may be so gentle as to be imperceptible to the senses, and discovered only by the aid of refined apparatus, or it may be of destructive violence. The motions thus characterized are of small amplitude, but are so rapid and brief that they are called shocks. Usually the ground moves upward and downward, or in a horizontal or an oblique direction through the space of a fraction of an inch, or at most of a small number of inches, and the oscillations are repeated several times. Vibratory motions are communicated to buildings, and in tall buildings the effects are apt to be cumulative, so that shocks imperceptible on the lower floors may be detected on upper floors. When shocks are severe they are usually accompanied by sounds comparable to the detonations from explosions near or distant. Other associated phenomena are fissures, faults, extravasations of water and mud, elevation, subsidence, the drying of springs, the opening of new springs, landslides, sea waves, and alluvial waves. The greatest fissures are formed in unconsolidated deposits, such as alluvium. They may open widely and immediately close, or they may remain open with a width of several feet. Their depth is undetermined, but must in some cases be considerable, as they have received the waters of streams for hours, and even days, before they were filled. Fissures formed in rocks are usually less than an inch in width. The partings known as "joints," which divide rock masses by systems of parallel planes, are thought to be due to the transmission of earthquake waves. Sometimes the fissures become faults through the vertical or horizontal displacement of one wall with reference to the other. Sometimes they serve for the escape of gases, water, and mud. Where large quantities of water and mud are extravasated, the fissures are locally enlarged so as to form tubular conduits, about the mouths of which the solid ejecta are heaped after the manner of a volcanic crater. The mud is supposed to be derived from subterranean layers of alluvium saturated with water. The elevation and subsidence associated with earthquakes may be either general or local. When general it is rarely detected, except where the region affected borders on the sea, whose level serves as a standard of comparison. The local phenomena consist usually in the subsidence of narrow belts of land lying between fissures. In some cases basins are thus created in which water gathers to form lakes. The vibrations not infrequently serve to precipitate partially detached rocks down mountain-slopes, and thus occasion avalanches, and from cliffs of softer material, at the margins of streams or upon coasts, blocks are detached which sink to the base as landslides. Sometimes the descent of an avalanche or landslide will throw a dam across a stream so as to create a new lake. When the shocks originate under the sea, surface waves are generated similar to those produced by throwing a pebble into a pool, and these sometimes acquire great dimensions, so that when they reach a coast they rush far up on the land. Analogous to these are surface waves produced in masses of wet alluvium. In localities where the semi-fluid character of the substrata is shown by the extravasation of mud, the surface of the ground is sometimes thrown into waves several feet in height, whose behavior is closely allied to that of the oscillatory waves of water. Violent earthquakes occurring in densely populated districts inflict great injury upon buildings, and not infrequently throw down their walls. At the seashore these disastrous results may be increased and even multiplied by the inrush of sea waves. Through the falling of walls, and especially through the rush of waves, many lives are lost, the fatalities sometimes amounting, in the case of individual earthquakes, to many thousands.

Earthquake Waves.—The observed tremors of an earthquake are superficial phenomena resulting from some subterranean shock, which is transmitted as an elastic wave through the material of the earth's crust. From the point of initial disturbance, known as the centrum, the waves pass outward in all directions with gradually diminishing energy. In the case of the earthquake at Charleston, S. C., in 1886 the shock was felt more than 900 miles away, and a comparison of time observations showed that its velocity of transmission was about 17,000 feet per second. Theoretically the initial shock gives rise to two waves, having different characters and traveling with different velocities. In one, called the compression wave, the motion of each particle of the transmitting medium is forward and back in a direction radial from the centrum; in the other, known as the distorsion wave, the motion of the particle is to and fro in a direction transverse to the radial direction. The wave of compression has the greater velocity. Whenever, as these waves pass through the earth's crust, a change in rock character is encountered, they are refracted and partially reflected, and as such changes are multifarious near the earth's surface, the waves reaching the surface are of the most complicated character, the original direction and rhythm being partially or wholly obscured. For an account of the principle of wave transmission, see the article WAVES.

Cause of Earthquakes.—While it can not be said that the causes of all earthquakes are known, important progress has been made in this direction. Many earthquakes are associated with volcanic phenomena in such way that the mode of their origin can not be questioned. These are of two classes, due severally to explosion and to the formation of fissures. When the lava of a volcano in eruption contains a large amount of water, the conversion of portions of this water into steam produces explosions which project masses of lava into the air, and the same explosions occasion jarring of the ground which may frequently be perceived at a distance of several miles, and which constitutes true earthquakes. It sometimes happens that the force contained in the heated and imprisoned water, instead of being spent in a series of minor explosions, is stored for a long period, and then produces a great explosion whereby the top of the volcano is blown off. A number of catastrophes of this character have occurred in historic times, and each has been accompanied by an earthquake extending to a distance of many miles. Earth waves of feebler force but identical in character have been produced by artificial explosives. The explosion of a mine for the removal of rocks from Hell Gate, near New York city, produced tremors which were observed at Clinton, N. Y., 175 miles away.

Other earthquakes connected with volcanoes do not accompany explosions, but are the preludes of eruption. After a long period of inactivity the rock of a volcano must be fissured in order that the lava may escape, and these earthquakes are referred to the fissuring of the rock under strains whose culminating effect is the opening of a vent for the lava. Accordant with this idea is the fact that the stumps of extinct volcanoes, whose bodies have been removed by erosion, exhibit systems of radial dikes formed by the injection of lava into fissures.

Earthquakes of a third class are associated with the development of mountain structure of a certain type. In an extensive district in Western North America the prevalent structure of mountain-ranges involves extensive faulting. Each range consists of one or more huge blocks of rock, bounded by faults and lifted above their neighbors. In modern times there have been two instances in which renewed movement has occurred on old fault lines of this region, and each of these movements has been accompanied by a great earthquake. Entirely similar phenomena were observed in New Zealand in 1885.

In numerous other instances earthquakes have originated in districts where there is no other evidence of recent volcanic activity or of recent orogenic disturbance, and in such cases causes can not be assigned with confidence. Still it is not difficult to formulate a possible cause which, while undemonstrated, appears to be competent. In portions of the earth's crust, where deforming forces are not of such nature and distribution as to up-raise mountain-ridges, there are, nevertheless, more or less localized elevations and subsidences, and with these differential movements it is reasonable to suppose that there are associated powerful strains. Wherever and whenever such strains suffice to overcome the elasticity of the rocks involved, either viscous flexure or rupture must result. If the local conditions determine rupture as the mode of dislocation, an earthquake is one of the consequences.

In the descriptive literature of earthquakes there is probably considerable confusion of cause and effect. In connection with an earthquake in 1822 several hundred miles of the coast of Chili were lifted to a height of several feet, and there is reason to believe that portions of the land at a distance from the sea were raised more than those at its border. It was computed that the volume of rock changed from a position below the plane of sea-level to a position above that plane was comparable in magnitude with Mt. Etna, and this stupendous result was supposed to have been caused by the earthquake. As the subject is at present understood, it appears more reasonable to suppose that the continent-making forces of the earth's crust, whatever their origin may be, tended to elevate that portion of South America, and for a long period had accumulated strains which were opposed by the elasticity or rigidity of the crustal material. When finally the resistance was overpowered by the strains, fractures occurred along certain critical lines, the tract of land rose, the strains were in great part relieved, and an earthquake occurred as an incidental result—a result of supreme importance to the unfortunate inhabitants of the country, but relatively insignificant as a phenomenon of physical geography. Of the local elevations and subsidences which occur in alluvial tracts in connection with earthquakes, it is probable that the greater number are consequences of the vibration of the land, and are more or less analogous to landslides, while a smaller number are direct result of faults by which the earthquakes were produced. The surface oscillations of the sea and of alluvial tracts, and the vibrations of air observed as sound, are all believed to result from the modification or transmutation of the elastic waves by which the shock of earth rupture is primarily transmitted.

In the study of earthquakes three classes of instruments have been employed. Seismoscopes are devices for determining automatically the time at which the vibration occurs. Seismometers are devices for determining the comparative violence or energy of earthquake shocks. Seismographs accomplish both these purposes, and also indicate the forms of the earthquake waves as they arrive at the surface of the ground. (See SEISMOGRAPH.) Such refinement has been attained in the construction of instruments of the last class that it is possible to record tremors which escape the senses, and their employment has led to the discovery that earthquakes are far more numerous than had been previously realized. In some regions feeble shocks are of almost daily occurrence, and there is probably no part of the earth in which they could not be detected at short intervals.

Earthquakes in the U. S.—The more important earthquakes are well described by Sir Charles Lyell in the second volume of his *Principles of Geology*, and other references to the literature are given at the close of this article. The most notable earthquakes of the U. S. occurred near the head of the Mississippi delta in 1811–12; in Inyo valley, California, in 1872; and at Charleston, S. C., in 1886. The Mississippi valley earthquake (1811), known as the New Madrid earthquake, was characterized by the great prolongation of its phenomena. Severe shocks occurred at short intervals during a period of several months, and the entire series of shocks covered a period of about two years. As the country was sparsely settled little is known of the distance to which the perceptible vibrations extended, but in the central tract the phenomena were of the most impressive character. It is related that alluvial land was traversed by visible waves which rocked the forest trees to and fro, uprooted some, and permanently entangled the branches of others. Fissures were opened and closed, not merely once, but at each successive shock, and mud of various kinds was thrown into the air with such violence as to lodge in the branches of trees. Some lakes were drained by the escape of their waters into fissures, and other lakes were created by the subsidence of the land. The largest sunken area is said to have been 60 or 80 miles in length, and nearly half as broad. The earthquake of Inyo valley was occasioned by a renewed movement along the great fault plane at the eastern base of the Sierra Nevada. The chief shock lasted but a few minutes, and those which followed at intervals were far inferior in violence. The series continued for two or three months. A principal fissure was formed along the base of the mountain-range for a distance of about 40 miles, and the land west of the fissure rose, or the land east of the fissure fell, through a space of several feet. In some places a second fissure was formed parallel with this, and was associated with a smaller displacement in the opposite direction, so that a tract a quarter of a mile in width was depressed below the adjacent tracts. The greatest displacement of this sort was about 25 feet. There were also horizontal displacements, a line of fence being in one instance dislocated 14 feet. Numerous fractures without vertical displacement were opened in the alluvium of Inyo valley. Owens river was temporarily swallowed, and a number of springs were permanently destroyed. In the village of Inyo all the houses were thrown down and one-tenth of the inhabitants were killed. The Charleston earthquake was preceded by minor tremors, to which little attention was given. The principal shock occupied about one minute, and other shocks followed at intervals with gradually diminishing violence. At the end of four weeks they had ceased to be destructive, but tremors were occasionally observed for several months longer. The foci of disturbance was about 15 miles W. of the city, and the most violent movements there were vertical. Numerous fissures were opened in the surrounding country and the extravasation of water and mud was sufficient to flood the channels of all the streams. The distortion of portions of the alluvial plain was illustrated by the dislocation and buckling of railway tracks. At Charleston the movements were oblique, and although less violent than those outside of the city, they were equally destructive. A large number of houses were thrown down, and nearly all were more or less injured, so that the damage was computed in millions of dollars. Twenty-seven persons were killed outright, and others died afterward from injuries received.

LITERATURE.—*Reports of British Association Committee on Earthquakes* (1850, 1852, 1858); *Transactions of the Seismological Society of Japan* (Yokohama, 1880–1890); R. Mallet, *Dynamics of Earthquakes* (Trans. Roy. Irish Acad., 1846); *The Great Neapolitan Earthquake of 1857* (2 vols., London, 1862); J. A. Ewing, *Earthquake Measurement* (Mem. Science Dept. Univ. of Tokio, No. 9, Tokio, 1883); J. D. Whitney, *The Owens Valley Earthquake* (*Overland Monthly*, vol. ix., San Francisco, 1872); C. E. Dutton, *The Charleston Earthquake of August 31, 1886* (*Ninth Annual Report, U. S. Geol. Survey*, Washington, 1889); J. Milne, *Earthquakes and other Earth Movements*, in International Scientific Series (New York, 1886). G. K. GILBERT.

Earths: in chemistry, compounds consisting each of a metal combined with oxygen. The earths proper are alumina, zirconia, ceria, glucina, thoria, didymia, lanthana, yttria, and erbia. Magnesia, baryta, lime, and strontia are

called alkaline earths, because they are less soluble in water than true alkalies, though they exhibit alkaline reactions. Their carbonates are insoluble in water, and are not alkaline.

Earth-shine (or, as it ought to have been called, **Earth-light**): a reflection of the sun's light from the earth to the moon, and back to the earth again. This phenomenon is often seen when the moon is very old or very new, the outlines of the full moon being rendered visible by the reflection.

Earthwork: in civil engineering, the construction of excavations, embankments in or with the natural earth. Earth is usually excavated and moved under contract at a fixed price per cubic yard, the measurement being made in the excavation. In cuttings for roads and railroads levels and measurements are taken at distances 100 feet apart from which the areas of the sections are computed. Then the number of cubic feet of earth between two stations may be closely found by adding together the two end areas and multiplying their sum by 50. This is called the method of mean areas, and it always gives quantities slightly in excess of the truth, except when the two end areas are equal. A more exact method of measurement is to find the areas of sections 50 feet apart, and then to use the prismoidal formula, which is $C = \frac{1}{6}l(A + 4M + B)$ where A and B are the areas of two end sections, M the area of the section halfway between them, and l the distance between A and B.

Earthwork occupies less space in the embankment than in the original excavation. Sand and gravel shrink about 8 or 9 per cent., clay about 10 or 11 per cent., and loam from 12 to 14 per cent. When the cuts in a railway do not furnish sufficient material for the embankments, the balance is procured from borrow-pits, or excavations in some convenient hillside. These borrow-pits are cut with vertical sides, so as to permit the precise measurement of the quantity removed, levels being first taken over the top surface.

If earth be devoid of cohesion, the sides of the cuts and embankments will ultimately be inclined planes, each kind of earth having its own special angle of inclination, known as the "angle of natural slope." The following table gives the angles of natural slope, the inclination expressed by the ratio of the horizontal to the vertical projection, and the

KIND OF EARTH.	Angle of natural slope.	Inclination.	Weight per cubic foot.
Gravel, round	30°	1·7 to 1	100
" sharp	40	1·2 " 1	110
Sand, dry	35	1·4 " 1	100
" moist	40	1·2 " 1	110
" very wet	30	1·7 " 1	125
Earth, dry	40	1·2 " 1	90
" moist	45	1·0 " 1	95
" very wet	32	1·6 " 1	115

weight per cubic foot of different kinds of earth. If, however, the earth be cohesive, slopes steeper than the natural slope can be built, but it is necessary to protect them from the action of the weather by sodding.

The lateral pressure of earth against a vertical wall is always less than the pressure of water. If w be the weight of a cubic foot of the earth, ϕ its angle of repose, given by the above table, and h the height of the wall, the formula $P = \frac{1}{2}wh^2 \tan^2(45 - \frac{1}{2}\phi)$ may be used to compute the horizontal pressure of the earth upon a lineal foot of the wall. The point where the resultant pressure is applied is, as in the case of water, at a distance above the base of the wall equal to one-third its height. This formula applies only to cases where the surface of the earth behind the wall is level. If the surface be inclined backward from the top of the wall at the angle ϕ, the pressure is given by $P = \frac{1}{2}wh^2 \cos^2\phi$.

MANSFIELD MERRIMAN.

Earthworks: fortifications or constructions, whether for attack or defense, in which earth is the principal material employed. See FORTIFICATIONS.

Earthworms: the popular name of a large number of species of worms belonging to many genera of OLIGOCHÆTÆ (*q. v.*) which are comprised in the great class of Annelida. Formerly they were all regarded as forming the family *Lumbricidæ*, so called from its principal genus, *Lumbricus*, but now they are much divided. In all the body is cylindrical, and is made up of many essentially similar rings placed one after another, all without external organs, except small bristles variously arranged which are used in locomotion. The mouth is provided with upper and under lips, and lacks teeth. The earthworms live on decaying vegetable matter, which they obtain either by swallowing leaves or earth which contains vegetable humus. The indigestible portions are voided on the surface as worm casts. The researches of Darwin have shown that earthworms are of immense value to agricultural interests, for they occur in the earth where there is moisture enough to sustain life, and they are continually working over the soil and passing it through their intestines. The earth thus eaten comes from below, while the worm casts are deposited on the surface. In this way about a fifth of an inch is annually added to the soil, while the same action serves to reduce inequalities and to bury beneath the surface stones and other objects. The earthworms are hermaphroditic, but are incapable of self-fertilization. Their eggs are laid in cocoons, and in some species we have the rare phenomenon of one egg producing two worms. Earthworms are also noticeable from the fact that when cut in two they are capable, to some extent, of reproducing the lost portions. In the temperate zone the largest species of earthworms rarely exceed 8 or 10 inches in length, but in the tropics they are much larger, an African species being an inch in diameter and nearly 6 feet in length. It is hardly necessary to state that earthworms do not rain down; those which are frequently found on the ground after storms have been driven from their burrows by the water. See Darwin, *The Formation of Vegetable Mould Through the Action of Worms* (London, 1881); Rolleston, *Forms of Animal Life* (new ed. 1888). J. S. KINGSLEY.

Ear-trumpet: an instrument for the relief of defective hearing. Ear-trumpets are of a great variety of forms, but they all depend upon the same principle—that of collecting and condensing the sound-waves, and thereby intensifying the impression made upon the ear. It is found in practice that a nice adjustment of parts is not necessary; sound being readily reflected along conical tubes, either straight or coiled, with great facility. Cases of comparatively slight deafness are aided by the wearing of "cornets," or small ear-trumpets attached by a spring to the ear and concealed by the hair of the wearer.

Earwax: See CERUMEN.

Earwigs [O. Eng. *ēorwicga*; cf. Fr. *perce-oreille*, Germ. *Ohrwurm*]: insects of the family *Forficulidæ*; so named from the popular delusion that they have a propensity to creep into the ear. They form a connecting link between the Coleoptera and the true Orthoptera. They have a narrow body, strong and horny mandibles, long antennæ, and a pair of forceps at the extremity of the abdomen. In the U. S. the name is applied to various small centipedes found about houses and beneath boards. See ENTOMOLOGY. Revised by F. A. LUCAS.

Easement: in law, in its most comprehensive sense, the right which the public or an individual has in the lands of another, not inconsistent with a general property in the latter. It is in the nature of a charge or burden upon land. It is called a *dominant right*, while the land burdened is termed the *servient estate*. Easements may be mere personal rights, when they are said to be *in gross*, or they may be connected with the ownership of land. The latter only will be considered. 1. They are incorporeal. 2. They are imposed on corporeal property. 3. They confer no right to the substance of the land. 4. There must be two distinct estates—the dominant, to which the right belongs; and the servient, upon which the obligation rests. They are affirmative or negative. Affirmative, when the owner of the dominant estate may do some act on the servient; and negative, when the owner of the servient estate must refrain from doing some act, otherwise lawful, on his land. The most important instances are the right of way (the right of the owner of one piece of land to pass over the land of another), of water (the right of the owner of the dominant estate to receive water from or discharge it across the servient estate), of support of the soil or of the buildings of the dominant estate by the adjacent soil or building of the servient estate.

Easements exist at common law, and may be created by statute. Common-law easements may arise in various modes. 1. By nature. This is a brief form of expression of a legal rule, that the owners of adjoining parcels of land may have a burden imposed upon them not to disturb the natural state of things. Thus where a natural stream of water flows from the land of one owner through the land of another, the former can not divert or diminish the quantity of water which would otherwise descend to the proprietor below, nor can the latter prevent the stream from discharging its water across his land. Each has an easement "by

nature" in the land of the other. 2. By dedication. This means an appropriation of land by its owner to a public use; e. g. as a street or park or public landing-place. The legal title to the land dedicated is not changed, but the public acquires a right to use it for the special purpose to which it is dedicated. These easements are sustained in law on the doctrine of estoppel, although there is no specific grantee. No particular form or ceremony is necessary to constitute a dedication. It is sufficient if the intention to dedicate appear, either by positive acts of the owner or long-continued acquiescence, and the public act accordingly. 3. By actual grant. In this case the nature and extent of the easement are determined by the words of the instrument creating it, which must be sealed. 4. By implied grant. An easement is created by implied grant when it is necessary for the enjoyment of that which is expressly granted or reserved. Thus if A is the owner of two lots, the first of which can be approached only over the second, and conveys either to B, the owner of the back lot has by implication a right of way across the front lot. 5. By prescription. This is the enjoyment of the right or privilege for so long a time as to raise the presumption of a grant. The length of time necessary to raise this presumption varies in different States, but, after the analogy of the statute barring disputed claims to land, it is usually twenty years. To obtain by prescription an easement in the land of another its enjoyment must have been uninterrupted for the required number of years, adverse to the owner of such land, and exercised under a claim of right. It must be open, so that the owner may be presumed to know of it. In England it is held to be a rule of common law that the right to light may be obtained by prescription. This is called the doctrine of "ancient lights." It would take place where the owner of one lot of land had windows opening on the vacant lot of another for twenty years. He would acquire such a right that buildings could not be constructed on the vacant lot so as to shut out the light from his windows. But in the U. S. this rule has frequently been repudiated by the courts as inapplicable to our rapidly growing and rapidly changing condition; and in a number of States an easement of light can be acquired only by express or implied grant.

Easements may be extinguished by a release given by the owner of the dominant to the owner of the servient estate, or by abandonment. The failure to make use of an easement (technically called non-user) for twenty years is strong evidence of abandonment if the easement was acquired by prescription, although the presumption may be rebutted; but if the easement were acquired by actual grant, no length of mere non-users would operate as an abandonment. In that case there must be acts inconsistent with the existence of the easement. An easement may also be extinguished by a union of the two estates in the same person. This is technically called "merger." T. W. DWIGHT.

East Africa, British: See IBEA.

East Africa, German: See GERMAN EAST AFRICA.

East Anglia: See ANGLIA, EAST.

East Aurora: village; on railway; Erie co., N. Y. (for location of county, see map of New York, ref. 5–C); beautifully situated 17 miles S. E. of Buffalo. It has a Union school and academy, a large flouring-mill and agricultural works, a manufactory of paper-makers' felts, the Jewett stock farm with a covered mile track, and Hamlin's village farm for horse-breeding. The village is the business center of a wealthy farming region, and a place of residence for Buffalo business-men. Pop. (1880) 1,109; (1890) 1,582; (1900) 2,366. EDITOR OF "ADVERTISER."

Eastbourne: a watering-place of Sussex, England; 3 miles N. N. E. of Beachy Head; in a chasm between two cliffs; has a martello tower, a fort, and a chalybeate spring (see map of England, ref. 14–K). Pop. (1891) 34,977.

East Brady: borough; on railway; Clarion co., Pa. (for location of county, see map of Pennsylvania, ref. 3–C); situated on the Allegheny river about 70 miles N. of Pittsburg. The chief industry is coal-mining. Pop. (1880) 1,242; (1890) 1,228; (1900) 1,233.

East Bridgewater: town; Plymouth co., Mass. (for location of county, see map of Massachusetts, ref. 4–J); on the Old Colony Railroad, 25 miles S. E. of Boston. It has valuable water-power, and large manufactures of brick, lumber, cotton-gins, nails, and other goods. Pop. of township (1880) 2,710; (1890) 2,911; (1900) 3,025.
EDITOR OF "STAR."

Easter [O. Eng. *ēastre*; Germ. *ostern* < O. H. G. *ōstara*, plur. *ōstarūn*, a festival named from the Teuton. goddess of spring, **austrō*; cf. Lat. *aurōra*, dawn, Gr. *ἠώς*, *ἕως*, Skr. *usra*]: the Lord's day or Sunday following that fourteenth day of the calendar moon which falls upon or next after Mar. 21 (in Gr. called *πάσχα*, Lat. *pascha*). This is true of both old style and new. Easter is the principal festival of the Christian year, observed in commemoration of the resurrection of our blessed Lord. The returns of this anniversary were originally regulated, and in imitation of this early usage have always continued to be, by the calendar of Judea, in which the months were conterminous with the revolutions of the moon. A mean lunation being, roughly, twenty-nine and a half days long, twelve lunar months, or a lunar year, fall short of a solar year by about eleven days. The beginning of the Jewish year therefore goes backward on the natural year eleven days annually, requiring an intercalary month to be introduced in the third year, and again in the sixth, ninth, eleventh, fourteenth, and so on. Any anniversary regulated by such a calendar as this is consequently *movable* in reference to a calendar regulated by the sun. The Resurrection took place just after the Jewish feast of the Passover, which was held on the fourteenth day of Nisan, the first month of the year—that is to say, the fourteenth day of the moon, or not far from the time of full moon. The Christians of Jerusalem, and after them those of the Asiatic Churches generally, were accustomed to hold the feast of Easter on this same day or simultaneously with the Jewish Passover. This usage was unacceptable to the Gentile Churches in Italy and the West generally, which preferred to celebrate Easter on the Sunday following the fourteenth day of the moon; and the difference of practice in this particular led to grave dissensions between the East and West, which were at length pacified by the agreement reached in the Council of Nicæa (A. D. 325), to make the Western usage universal. In order to find the time of Easter for any given year, it would seem that we should calculate the exact time of the new moon in that year for March, and try whether the fourteenth day of that moon (the day of new moon itself being counted the *first*) would fall not earlier than the 21st, in which case the Sunday following this fourteenth day might be presumed to be Easter. But should this fourteenth day fall earlier than Mar. 21, we should conclude that the new moon of April must be taken. The ecclesiastical calendar, however, is only nominally dependent on the moon in the heavens, the true moon and the calendar moon sometimes differing in their age more than two days. The practical reason for this is that if the astronomical time of new moon is taken, this time will not be the same in the local times of different longitudes; so that a meridian may always be assigned such that the same new moon may fall on different calendar days on different sides of it. And if the calculation is very nicely made, when new moon happens exactly at midnight of Saturday or Sunday in the middle of a large city like London, the east and west halves of the city may have their Easter upon two very different days. The ecclesiastical moon is therefore an ideal or artificial moon; and in determining the beginning and end of each lunation no account is taken of any differences smaller than a day. In order to divest the ecclesiastical calendar as much as possible of complexity, advantage is taken of the fact discovered by Meton, an Athenian astronomer in the fifth century before our area, that in a period of nineteen solar years the sun and the moon return almost exactly to the same relative positions which they occupied at the beginning of this period, the difference amounting to little more than the space the moon would move over in two hours. The calendar therefore assumes that the moons determining Easter will recur in the same order every nineteen years throughout an entire century, and sometimes throughout two or three centuries. The Easters themselves do not therefore necessarily recur on the same days of the month of March or April in each of these successive series of nineteen years, but would do so if the same days of the week always corresponded to the same days of the month. This, however, is not usually the case; and as Easter must be Sunday, it is necessary, in order to fix definitely the date of Easter in any given year, to know both the place of the year in the series of nineteen (or in the Metonic cycle) and also the day of the week on which the year began, or (what is practically the same thing) the dominical letter for the year. Various methods have been given for finding Easter, but all of them begin, expressly or implicitly, with the determination of these two elements. The rules given

by Prof. de Morgan in the *Companion to the British Almanac* for 1845 occupy about a page. See also *The Book of Almanacs, with an Index of Reference, by which the Almanac may be found for every year, whether in Old Style or New, from any epoch, ancient or modern, up to A. D. 2000, with means of finding the day of any new or full moon from B. C. 2000 to A. D. 2000*, compiled by Augustus De Morgan, etc. (London, 1851), and Bishop Samuel Butcher's *The Ecclesiastical Calendar: In Theory and Construction* (Dublin and London, 1877). The formulæ of Delambre, in the first volume of his *History of Modern Astronomy*, and those of Gauss, given in the first volume of the *Theoretical and Practical Astronomy* of the same writer, though concise as mathematical expressions, involve much laborious computation in their practical application. The following rules, however, originally devised by President Barnard, of Columbia College, New York, are very simple and easy. It is to be observed, first, that the fourteenth day of the Easter moon, being approximately the time of full moon, is called the *paschal full moon*. The number of the year in the lunar cycle is also called the Golden Number. (See GOLDEN NUMBER.) Then, supposing that we know the golden number and the dominical letter, we find, for the present century, the paschal full moon as follows:

If the golden number is *odd*: To four times the golden number add *ten*; and

If the golden number is *even*: To four times the golden number add *twenty-five*.

The result, in either case, if greater than twenty and less than fifty, is the date of paschal full moon, *considered as a day of March* (that is to say, if it happens to be, say thirty-three, it is the thirty-third of March = Apr. 2, and so on). If not greater than twenty and less than fifty, add *thirty*, or subtract *thirty*, or *twice thirty*, if necessary to make it so, and the result is once more paschal full moon.

Then, to find Easter: To the constant number *eighteen* add the numerical value of the dominical letter (i. e. A = 1; B = 2; C = 3, etc.), and the sum, if greater than the value of paschal full moon just found, is the date of Easter; but if not, add *seven*, or *twice seven*, or *three times seven*, and so on till a total is obtained which exceeds that value; and this total is the date of Easter considered as a day of March.

To find the golden number and the dominical letter: In either case first separate the hundreds in the number expressing the given year of our Lord from the years less than 100, and treat the parts independently of each other. First, for the dominical letter: If the hundreds be divided by *four*, the remainder from the division will have one or other of the following values—viz., 0, 1, 2, 3. And the dominical letters belonging to the hundreds which give these remainders respectively will be A, C, E, G = 1, 3, 5, 7. These, for convenience, call *centurials*. Then for the *years* take half the largest number divisible by *four*—i. e. half the number of the latest leap-year—increase this by *seven*, and subtract the excess of fours (i. e. the remainder left in the previous division by four). To this result add the centurial, and the excess of sevens in the sum will be the value of the dominical letter; it being observed that if there is no excess the dominical letter has the value of seven itself, or is G. Leap-years have two dominical letters—one for January and February; the other, which is less than the former by a unit, for the remainder of the year. This last, which only is used in finding Easter, is that given by the rule.

To find the dominical letter for *Old Style* the process is the same except as to the centurial. The centurial for old style is found by adding *three* to the number of *hundreds*, and suppressing *sevens*. Thus if the hundreds be *fifteen*, we have 15 + 3 = 18. And 18 with seven dropped as often as possible leaves 4, which is the old style centurial. If there is *no* excess of sevens, the centurial is seven itself.

Secondly, for the golden number: Add a unit to the number expressive of the given year; then divide the *years* by *twenty*, and add the quotient to the remainder. Next divide the centuries by *four*, and add the quotient to *five times* the remainder. Finally, add the two results, and the sum, if nineteen or less, is the golden number. If it exceeds nineteen, drop nineteen, or, if necessary, twice nineteen, and the number left, being not greater than nineteen, will be the golden number.

Take, as an example, the year 1873. For the dominical letter: 18 ÷ 4 gives 2 remainder, and the *centurial* is accordingly 5. The number of the largest leap-year in 73 is 72, and the half of this is 36. Then 36 + 7 = 43, and 43 − 1 = 42. Finally, 42 + 5, with the sevens suppressed, is evidently 5 = E, which is the dominical letter of 1873.

For the golden number: 1873 + 1 = 1874. Then, 74 ÷ 20 = 3, with 14 remainder, and 14 + 3 = 17. Also, 18 ÷ 4 = 4, with 2 remainder, and 2 × 5 + 4 = 14. Then, 17 + 14 = 31, and 31 − 19 = 12, the golden number for 1873.

For Easter in 1873: 12 × 4 + 25 = 73. Then 73 − 30 = 43, or paschal full moon is the forty-third day of March. To 18 add 5, the value of the dominical letter, and the result, 23, is smaller than the date of paschal full moon. But 23 + 7 + 7 + 7 = 44, which is greater than that date (43), and Easter is the forty-fourth day of March, or Apr. 13.

There is one case not provided for in the foregoing. If in finding paschal full moon we obtain a result which is *exactly twenty* or *exactly fifty*, adding or subtracting thirty will not bring it between those limits. In this case paschal full moon must be taken at 49. There is also an irregularity arbitrarily introduced by the mathematicians of Pope Gregory XIII., by whom the calendar was regulated, which is this: Should the rules above laid down give *forty-nine* directly as the date of paschal full moon, *this must be reduced to forty-eight in case the golden number is 12 or upward*; not otherwise.

For centuries earlier or later than the present, the rules are the same, except that the numerical terms *ten* and *twenty-five* used in finding paschal full moon are liable to variation (but do not always vary) in passing from century to century. The second of these terms always exceeds the first by *fifteen*. The first may be found for any century up to the forty-second by the following rule: From the number of the centuries take its fourth part and its third part (disregarding fractions in both cases), and increase the result by *two*. Thus for the twentieth century we have 20 − 5 − 6 + 2 = 11. Hence these numerical terms for the next century will be 11 and 26. In *old style* dates these numerical terms are invariable, and are always *two* for odd golden numbers and *seventeen* for even. See the *Journal of the Proceedings of the General Convention of the Protestant Episcopal Church in the United States* for 1871, Appendix, pp. 538–559.*

The principal festivals and fasts of the Church dependent for the time of their celebration upon Easter are Septuagesima Sunday, nine weeks before Easter; Ash Wednesday, which is the Wednesday of the seventh week before Easter; Good Friday, which is the Friday next before Easter; Ascension Day, which is the Thursday of the sixth week after Easter; Whitsun Day, the seventh Sunday after Easter; and Trinity Sunday, the eighth Sunday after Easter.

Revised by WILLIAM STEVENS PERRY.

Easter, or **Waihu, Island**: a small island of volcanic origin in the Pacific Ocean; lat. 27° 6′ S., lon. 109° 30′ W.; area, 47 sq. miles. It is 11 miles long and 4 miles wide; rises 1,200 feet above the level of the sea, and is scantily supplied with water. It is the easternmost inhabited Polynesian island. The inhabitants have traditions of their ancestors having come from the island of Oparo, 1,900 miles distant. The island has wonderful colossal statues in stone. It has belonged to Chili since 1888. Pop. (1882) 150.

Eastern Archipelago, also called **The Malay Archipelago**: all those islands which lie in the northeastern part of the Indian Ocean. Area about 650,000 sq. miles. They are divided, according to their position, into three groups. The first group comprises the Molucca islands, the Spice islands, Banda, Amboina, Ternate, and the Philippines; the second group consists of Sumatra, Java, and the small Sunda islands east of Java, from Bali to Timorlaut; and the third comprises Borneo and Celebes, together with a large number of smaller islands, as Billiton, Banca, Singapore, etc. In its position this archipelago forms the connection between Asia and Australia. Its soil is very fertile, and resembles in its products that of the neighboring countries of Asia. It has therefore attracted at all ages almost every nation. The original inhabitants consisted of many tribes, but all belonged to one race called the MALAY RACE (*q. v.*). At a later age the Arabs went to these islands, and as a consequence Mohammedanism gained a good many followers. At last the Europeans came and subjugated almost the entire archipelago. The Dutch have become masters of the greatest number of islands; while the Spaniards had only the Philippines; the Portuguese have Dilli and part of Timor;

* This valuable and exhaustive paper is perhaps the most important contribution to the printed literature of this subject extant.
W. S. P.

and the British, Singapore, Labuan, and Northern Borneo. Besides these races, a large number of Chinese are found throughout the islands. The total population is estimated at 23,000,000. See Wallace, *Malay Archipelago* (1890); Keane, *Eastern Geography* (2d ed. 1892).

Eastern Churches: several bodies of Christians in Western Asia, Eastern Europe, and Africa. They are in three divisions: I. The Orthodox Greek Church, composed of ten independent bodies, substantially one in discipline and doctrine, in mutual sympathy, and in deference to Constantinople, numbering about 84,000,000, of whom about 61,000,000 are in Russia. II. The National Churches, consisting of: (1) The Nestorian (since 498 A. D.), numbering about 150,000 in Turkey and Persia, besides 100,000 (Independent St. Thomas Christians) in India. (2) The Armenian (since 491 A. D.), very widely dispersed, numbering about 3,000,000. (3) The Syrian: A. Jacobites (since 451 A. D.), numbering about 350,000; B. Maronites (since 680 A. D.), numbering 250,000, and since 1182 A. D. under the pope. (4) The Coptic, in Egypt (since 451 A. D.), numbering about 500,000. (5) The Abyssinian (since 451 A. D.), numbering about 1,250,000. These all seceded from the Greek Church on Christological issues. III. The United Churches, which have submitted to the pope, accepted the Filioque of the Latin Church and the doctrine of the two natures in Christ, and are allowed vernacular liturgies, clerogamy, and the communion in both kinds. These churches are: (1) United Greek, mostly since the Protestant Reformation, and mostly in Austria, Hungary, and the Turkish empire, numbering nearly 5,500,000. (2) United Nestorian (since 1553), numbering 20,000 in Turkey and Persia, and 150,000 in India. (3) United Armenian (since 1316–34 A. D.), numbering about 100,000, among whom an anti-papal schism occurred in 1869. (4) United Syrian [Jacobite], very few in Syria (since seventeenth century), but 160,000 in India (since 1553). (5) United Coptic (since 1732), numbering about 10,000 or 12,000. (6) United Abyssinian (since 1828), numbering, it is claimed, about 50,000.

Eastern Empire: See Byzantine Empire.

Eastern Question: the problem that confronts nations whose territories border upon or extend into the Balkan Peninsula (*q. v.*), or whose interests would be affected by changes in the governmental systems of that region. It involves the future of the countries in Eastern Europe that have separated from Turkey, as well as the fate of the European possessions of that state itself. Throughout the eighteenth century Russia and Austria made attempts upon the Turkish territory in Europe, but the jealousy of the other powers prevented the plunder of the weaker state. In the nineteenth century the steady tendency has been toward the disintegration of Turkey in Europe, with the result of erecting on the Balkan peninsula a number of independent or semi-dependent states, the fear of whose annexation by one or another of the great powers gives to the Eastern question its formidable character. The question has been complicated by the desire of Russia to establish a protectorate over the Christian subjects of the Sultan, by her ambition to extend her borders to the Bosphorus, and by the apprehension on the part of the British Government that these Russian designs might imperil the Eastern possessions of Great Britain. The term sometimes refers to the conflicting interests of Great Britain and Russia on the frontiers of their Eastern territories, and in this aspect of the question Persia, Turkestan, Afghanistan, and India all fall within its scope. See Crimean War and Russo-Turkish War.

F. M. Colby.

Eastern Rite, or **Oriental Rite**: the ritual of those branches of the Roman Catholic Church which acknowledge the supremacy of the pope, but which do not employ the Latin ritual. The United Christians of St. Thomas have no bishop of their own, but are under the vicar-apostolic of Verapoli, who is of the Latin rite; but the people and clergy use, in part, a modified Syrian rite.

The Eastern rite differs from the Latin, not only in the languages employed in the service (Greek, Slavic, Armenian, Syriac, Ethiopic, Coptic), but generally also in the use of both elements for the laity in the Eucharist, and in the permission of marriage to the lower clergy.

Eastern Rume'lia: a formerly autonomous province, now Southern Bulgaria. It extends from the upper waters of the Maritza eastward to the Black Sea, and S. of the Balkan Mountains. It was collated as a province by the treaty of Berlin in 1878, but, because of a successful revolution, it was placed under the King of Bulgaria in 1886, and is practically a province of that kingdom.

Eastern Shore: a name given to those parts of Maryland and Virginia which are E. of Chesapeake Bay, and sometimes applied to the whole peninsula, including, in addition, the entire State of Delaware. The Eastern Shore has been proverbial for its conservatism, and from the character of its inhabitants claimed the title of "the land of gentlemen"; but it is now traversed by railroads, and the excellence of its soil and climate for peach-culture and market-gardening has caused the development of much industrial enterprise. Its western side is remarkably indented by navigable rivers and creeks, affording great commercial advantages. The waters on both sides abound in oysters, which are a source of great wealth. The fisheries are also extensive. Most of the surface is low and level, but healthful. Malarial fevers are endemic at some places. The climate is singularly mild. Bog-iron ore of fine quality is extensively mined in some parts. Kaolin is found in the extreme N. Oak timber is cut in some parts for market.

East Greenwich: town (incorporated in 1677); capital of Kent co., R. I. (for location of county, see map of Rhode Island, ref. 9–N); situated on railway and on Narragansett Bay; 14 miles from Providence. It has an academy (under the supervision of the Boston University), a free library, two cotton-mills, a woolen-mill, print-works, and a good harbor. Pop. of township (1880) 2,887; (1890) 3,127; (1900) 2,775.

East Hampton: town and railway junction (founded in 1664); Hampshire co., Mass. (for location of county, see map of Massachusetts, ref. 3–E); 5 miles S. W. of Northampton. It is the seat of Williston Seminary for young men, and has a public library and manufactures of suspenders, shoe web, cotton yarns, pumps, vulcanized rubber, buttons, etc. Pop. of township (1880) 4,206; (1890) 4,395; (1900) 5,603.

Editor of "News."

East Humboldt Mountains: a lofty range in Elko co., Nev., some of whose peaks exceed 12,000 feet in height. Secret valley and Fremont Pass cut the range, which is in parts well timbered with pines and firs, affording lumber. Its snows feed the springs by which Lakes Franklin and Ruby are supplied.

East India Company: a famous joint-stock trading company formed in England to carry on commerce with the East Indies. In 1600 a royal charter was granted to a number of London merchants under the title of "The Governor and Company of Merchants of London trading to the East Indies." This charter gave them an exclusive right to trade for fifteen years within certain limits, which were of immense extent. They established factories at Surat, Cambay, and other places in India about 1612. The charter was renewed from time to time. Madras was founded in 1639, and Calcutta in 1645. In 1698 the king granted a charter to a rival company, but the two companies were united in 1702 under a new charter, with the title of "The United Company of Merchants trading to the East Indies." Every person who held £500 of the company's stock became a member of the court of proprietors, who annually chose a court of directors composed of twenty-four members, each of whom must own £2,000 of the stock. The executive power of the company was vested in this court of directors, each of whom retained his office for four years.

In 1708 Parliament granted the company the exclusive privilege of trading to all places eastward of the Cape of Good Hope to the Strait of Magellan. The monopoly of the China trade was abolished in 1833, and the company was then deprived of its original character as a commercial association. Many years before this date the company had become a great territorial power, and had laid the foundation of the British empire in India. By conquest and other means the company obtained sovereign power over vast regions of Hindustan. This region was coveted by the members of the company not only as a source of commercial profit, but as a field in which their relatives might enrich and distinguish themselves by political and military enterprises. By the act 3 and 4 William IV. the functions of the East India Company were rendered merely political. It was to continue to govern India, with the concurrence and under the supervision of the board of control. All the real and personal property belonging to the company on Apr. 22, 1834, was vested in the crown, and to be held or managed by the company in trust for the same; and the

stockholders were to receive an annual dividend of 10½ per cent. on a capital of £6,000,000 out of the revenues of India. The Sepoy mutiny of 1857, which was repressed with a great expenditure of life and treasure, combined with other causes, induced Parliament to transfer the dominion of India to the crown. This change was effected, after strenuous opposition from the company, in 1858. See INDIA.

The Dutch East India Company was formed in 1595–1602. After more than a century of active rivalry with the English company, the two were forced to make common cause against outside adventurers in 1722. Soon after this a more formidable rival appeared. The French company, established in 1664, had under the able management of LA BOURDONNAIS and DUPLEIX (*q. v.*) become more than a match for the English company, and it was only by the genius of Clive that the French were overthrown and English supremacy was established. (For the events connected with the growth of English supremacy in India, see CLIVE and HASTINGS.) Other East India companies (Danish, Swedish, Scottish) were of relatively slight importance. Revised by A. T. HADLEY.

East Indies: a popular but somewhat vague term applied to that part of Southeastern Asia occupied by farther India or Indo-China and the Malay Archipelago, the principal subdivisions being Lower Burma, Siam, Laos, Annam, Sumatra, Java, and the other Sunda islands, Borneo, Celebes, the Banda islands, the Moluccas islands, and the Philippine islands. The area of these, approximately given, is 1,157,200 sq. miles, and the estimated population about 50,383,700. As used by some writers, the term includes Hindustan, and even China and Japan. In the fifteenth century India or the Indies was a name applied by Europeans to an undefined region beyond the Indus, known to them only through the reports of occasional traders. Columbus and the other discoverers of the islands in the western hemisphere believed that the countries found were the western regions of India, and Ferdinand of Spain accordingly assumed the title of King of the Indies. Further explorations by the Spaniards and the discoveries of the Portuguese in the East led geographers to discard "the Indies" as too comprehensive, and to apply the name East Indies to Hindustan and that of West Indies to America. Subsequently "West Indies" was restricted, as at present, to the archipelago comprising the Bahamas, the Greater and Lesser Antilles, and the Virgin islands, while Hindustan and farther India were collectively called India. The Dutch in forming their first company for trade with the East used the term East Indies in its wide sense. After the British occupied Hindustan that country became commonly known as India, but was often called the East Indies, especially in parliamentary papers. See EAST INDIA COMPANY.

Revised by M. W. H.

Eastlake, Sir CHARLES LOCK: historical painter; b. in Plymouth, England, Nov. 17, 1793. Pupil of Royal Academy and Haydon, London; Royal Academician 1830; president R. A. 1850; knighted 1850. Appointed keeper of the National Gallery 1843; published *Materials for a History of Painting* (1847); a prominent figure in British art of the nineteenth century. *Lord Byron's Dream* (1827) is in the National Gallery, London. D. in Pisa, Italy, Dec. 24, 1865. W. A. C.

East Liverpool: city; Columbiana co., O. (for location of county, see map of Ohio, ref. 3–J); on railway and on the Ohio river; 44 miles W. N. W. of Pittsburg and 44 miles E. of Wheeling; has excellent educational advantages; is one of the most important pottery-ware manufacturing centers in the U. S., having thirty potteries, and has an electric railway uniting Wellsville and East End. Pop. (1880) 5,568; (1890) 10,956; (1900) 16,485. EDITOR OF "REVIEW."

East Lothian: See HADDINGTONSHIRE.

Eastman: town; on railway; capital of Dodge co., Ga. (for location of county, see map of Georgia, ref. 5–I); situated 56 miles S. S. E. of Macon, in a section engaged chiefly in farming, lumbering, and sheep-raising; ships large quantities of yellow pine lumber, naval stores, cotton, and wool. Pop. (1890) 1,082; (1900) 1,235.

EDITOR OF "TIMES-JOURNAL."

Eastman, HARVEY GRIDLEY, LL. D.: educator; b. in Marshall, Oneida co., N. Y., Oct. 16, 1832. Having taught school in various places, he founded Eastman National Business College on Nov. 3, 1859, in Poughkeepsie, N. Y. He was thrice elected to the mayoralty of Poughkeepsie; a member of the New York State Assembly 1871 and 1876; for eight years State commissioner of public charities. He received the honorary degree of LL. D. from Ingham University. D. in Denver, Col., July 13, 1878.

Eastman, SETH: army officer; b. in Brunswick, Me., Jan. 24, 1808; graduated at West Point in 1829. He entered the infantry, and was teacher of drawing at West Point 1833–40. He published a *Treatise on Topographical Drawing* (1837) and a *History, etc., of the Indian Tribes* (1850–57). In 1863 retired with the rank of lieutenant-colonel and brevet brigadier-general. D. in Washington, D. C., Aug. 31, 1875.

Easton: town; on railway; capital of Talbot co., Md. (for location of county, see map of Maryland, ref. 3–G); situated on a navigable branch of the Great Choptank river; 55 miles S. E. of Baltimore. It is the seat of a Protestant Episcopal bishop, and has the schools of the diocese of Easton; also an orphan asylum, high school, peach-canning, and fruit-drying establishments, manufactures of lumber, sashes, castings, and farming implements, gas-works, etc. Pop. (1880) 3,005; (1890) 2,939; (1900) 3,074.

Easton: township of Bristol co., Mass. (for location of county, see map of Massachusetts, ref. 5–I); on Old Colony Railroad; has a free library, very extensive shovel-manufactory, and manufactures of boots, shoes, hinges, thread, etc. Pop. (1880) 3,902; (1890) 4,493; (1900) 4,837.

Easton: city and railway center; capital of Northampton co., Pa. (for location of county, see map of Pennsylvania, ref. 4–J); situated at the confluence of the Delaware and Lehigh rivers; 75 miles from New York and 60 miles from Philadelphia. It was settled in 1790, is the seat of LAFAYETTE COLLEGE (*q. v.*), and has a silk-mill, a large shoe-factory, felt-works, several organ-factories, and other industrial establishments, gas and water works, electric street railways, electric lights, and a complete system of sewers. The famous treaty with the Five Nations is recorded as having taken place at the forks of the Delaware. Pop. (1880) 11,924; (1890) 14,481; (1900) 25,238. South Easton borough annexed since 1890.

EDITOR OF "EXPRESS."

Easton, JAMES: a Revolutionary officer; b. in Hartford, Conn.; a builder by trade; became a resident of Pittsfield, Mass., in 1763. He raised a regiment in 1775, served at Ticonderoga, and in Canada under Montgomery, expending his whole fortune in the service. In 1776, after receiving the thanks of Congress, he was obliged by his enemy, Benedict Arnold, to leave the army. D. at Pittsfield, Mass., in poverty.

Easton, MORTON WILLIAM, Ph. D.: philologist; b. in Hartford, Conn., Aug. 18, 1841; studied at Yale, Columbia, and the University of Vienna; Professor of Comparative Philology in the University of Tennessee, and now in the University of Pennsylvania; author of articles in the *Journal of the American Oriental Society*, the *Transactions of the American Philological Association*, the *American Journal of Philology*, and the publications of the Modern Language Association. B. I. W.

East Orange: township; Essex co., N. J. (for location of county, see map of New Jersey, ref. 2–D); situated on the D., L. and W. Railroad and the Wachung Branch of the N. Y. and Greenwood Lake Railway; 12 miles from New York and adjoining Newark on the W. It is a place of suburban residences for New York business men, has a high school, several private schools, a number of churches, and is supplied with water from artesian wells. Pop. (1880) 8,349; (1890) 13,282; (1900) 21,506.

EDITOR OF "GAZETTE."

Eastport: city and port of entry; Washington co., Me. (for location of county, see map of Maine, ref. 7–G); situated on Moose island in Passamaquoddy Bay, at the extreme eastern point of the U. S. It has a good harbor; the tide rises 25 feet. It is the center of an important sardine industry, employing over 3,000 operatives in its eighteen factories. It is also a popular summer resort, and across the harbor, on the island of Campobello, are very large summer hotels. Daily steamers to Boston, Portland, Calais, and St. John, N. B.; weekly steamer to New York. Pop. of township (1880) 4,006; (1890) 4,908; (1900) 5,311.

EDITOR OF "SENTINEL."

East Portland: formerly a city of Multnomah co., Ore.; consolidated with PORTLAND (*q. v.*) in 1891.

East River: a strait connecting Long Island Sound with New York Bay, and separating the city of New York from

EAST INDIES
English Miles
0 50 100 200 300 400 500
British
Dutch
Portuguese
United States
SIAM
LOWER BURMA
RANGOON
Pegu
Maulmain
Zimme
Lapoon
Phitsanulok
Pon pissai
Me Kong
Me Nam
Ubon
Korat
Bassac
BANGKOK
Tenasserim
GULF OF SIAM
CAMBODIA
Pnom Penh
SAIGON
Binh Tuan
Phuyen
Kwinhoh Binh-dinh
HUE
Kwang-nam
ANAM
Vigne
Hai nan
FRENCH COCHIN CHINA
C. Cambodia
Pulo Condore
SOUTH CHINA SEA
Paracel Is.
Amphitrite
Lincoln
Crescent
Discovery
Triton
Bombay
Macclesfield Bank
North Danger
Trident Shoal
Spratly
Amboyna
Rifleman Bk.
Swallow R.
Royal Charlotte
Louisa R.
North Luconia Shoals
South Luconia Shoals
Prince of Wales Bk.
Prince Consort Bk.
Vanguard Bk.
Lower Siam
Malacca Strait
MALAY PENINSULA
Pekan
Pahang
Malacca
Sungei Ujong
George Town
Penang I.
Prov. Wellesley
Achin
Kota Raja
Medan
Tanjong Balei
Labuan Batu
Nias
Great Chan
Siberut
PADANG
Mentawei Is.
Nassau Is.
Bencoolen
SUMATRA
Jambi
Palembang
Lahat
Telling Tinggi
Lampong
Sunda Strait
Engano or Telanjang
SINGAPORE (British)
Bintang
Rhio (Riouw)
Rhio-Linga Archipelago
Linga
Singkep
Berhala Strait
Banka
Billiton
Karimata Is.
Karimata Strait
Gaspar Str.
Anambas Is.
Natuna Islands
Great Natuna or Bunguran I.
Tambelan Is.
BORNEO
SARAWAK
KUCHING
Sambas
Montrado
Pontianak
Sintang
Sukadana
BRUNEI
Labuan I.
NORTH BORNEO
Kutei
Dusun and Dayak
BANJERMASSIN
Martapura
Pulo Laut
JAVA SEA
Thousand Is.
Karimon Java Is.
Bawean
BATAVIA
Bantam
Cheribon
Samarang
Surabaya
Madura
Kediri
Probolingo
JAVA
Bali
Lombok
Bali Str.
Lombok Str.
Kangean Is.
Solombo Is.
C. Sambar
A B C D E F
95 100 105 110 115

PACIFIC OCEAN
PHILIPPINE ISLANDS
LUZON
MANILA
Mindoro
Samar
Negros
Zebu
MINDANAO
SULU SEA
SULU ARCHIPELAGO
CELEBES SEA
CELEBES
MENADO
Minahassa
Gulf of Tomini
Gulf of Boni
MACASSAR
HALMAHEIRA (JILOLO)
TERNATE
MOLUCCAS
Sula Is.
Buru
Ceram
Amboina
Banda Is.
BANDA SEA
FLORES SEA
South West Islands
TIMOR
TIMOR SEA
Sumba or Sandalwood
Flores Mangerai or Endeh
Kupang
Tenimber Is. or Timor Laut
Aru Is.
Evar or Kei Is.
ARAFURA SEA
Melville I.
AUSTRALIA
Wessel Is.
NEW GUINEA
Geelvink Bay
Schouten Is.
Charles Louis Mts.
Frederick Henry I.
Palao or Pelew Is.
Uap or Yap
Waigeu
Equator
Longitude E. of Greenwich

Brooklyn. It is nearly 10 miles long, and is navigable by large vessels. See HELL GATE.

East Saginaw: formerly a city of Saginaw co., Mich., consolidated with SAGINAW (*q. v.*), May 3, 1890.

East St. Louis: city and railway center; St. Clair co., Ill. (for location of county, see map of Illinois, ref. 9–D); on the Mississippi river opposite St. Louis. It has a Roman Catholic college, six large public schools, rolling-mills, industries in steel, brass, malleable iron and glass, elevators, stock-yards and packing-houses, electric street railways, etc. Pop. (1880) 9,185; (1890) 15,169; (1900) 29,655.

EDITOR OF "GAZETTE."

East Weymouth: village of Weymouth township, Norfolk co., Mass. (for location of county, see map of Massachusetts, ref. 5–I); situated on the Old Colony Railroad, 14½ miles S. of Boston. It has important manufactures of boots, nails, etc. Pop. of Weymouth township (1880) 10,570; (1890) 10,866; (1900) 11,324.

Eastwick, EDWARD BACKHOUSE: Orientalist; b. at Warfield, Berkshire, England, Mar. 13, 1814; educated at Oxford; entered the service of the East India Company, and filled important positions in Kathiawar and Sind. He was Professor of Hindustani at Haileybury College from 1845 to 1859, when he was appointed assistant political secretary in the India Office. From 1860 to 1863 he was secretary of legation in Persia. D. at Ventnor, Isle of Wight, 1883. He published a number of translations from the Persian: Saadi's *Gulistan* (1852); *Arrival of the Parsees in India* (1845); *Life of Zoroaster* (1843); and *Anvar-i Suhaili* (1854). Besides these, he wrote a *Hindustani Grammar* (1847); *Journal of a Diplomate in Persia* (1864); and *Kaisar-nama-i-Hind, or Lay of the Empress* (1878–82).

Eaton: village; on railway; capital of Preble co., O. (for location of county, see map of Ohio, ref. 6–C); situated on Seven Mile Creek, 53 miles N. of Cincinnati. It has no manufactures, and is surrounded by a fine farming country. Pop. (1890) 2,934; (1900) 3,155. EDITOR OF "REGISTER."

Eaton, AMOS: botanist and geologist; b. in Chatham, N. Y., May 17, 1776; graduated at Williams College in 1799; studied law and was admitted to the bar. In 1828 he became principal and senior professor of Rensselaer Institute at Troy. He published, besides other works, *A Geological and Agricultural Survey of the District adjoining the Erie Canal* (1824) and a *Manual of the Botany of North America* (1833; 7th ed. 1836). D. in Troy, N. Y., May 6, 1842.

Eaton, DANIEL CADY, B. Sc., M. A.: botanist; b. at Fort Gratiot, Mich., Sept. 12, 1834; educated at Yale and Harvard; Professor of Botany at Yale (1864). His principal publications are *Ferns of North America* (1879–80); *Filices Wrightianæ et Fendlerianæ* (1860); the *Compositæ* of Watson's Report of the Botany of King's Survey (1871); and the *Filices* of Chapman's and Gray's *Manuals*. D. in New Haven, Conn., June 29, 1895.—His cousin, DANIEL CADY EATON (b. at Johnstown, N. Y., June 16, 1837), was Professor of the History and Criticism of Art in Yale College 1869–76, and published *Handbook of Greek and Roman Sculpture* (Boston, 3d ed. 1886), besides pamphlets on various subjects.

Eaton, DORMAN BRIDGMAN, LL. D.: lawyer; b. at Hardwick, Caledonia co., Vt., June 27, 1823; graduated at the university of that State in 1848; studied law at the Harvard Law School, and began to practice as a lawyer in New York in 1850 jointly with Judge Kent: edited the seventh edition of *Kent's Commentaries*. He drew up the health laws of New York which created the board of health in New York city. In 1873 he succeeded George William Curtis as a member of the civil service commission, and was its chairman until its dissolution in 1875. In 1877 he published a large volume on the civil service of Great Britain, which has appeared in two editions. He drafted the National Civil Service Act approved Jan. 16, 1883. In Mar., 1883, he was made a member of the new civil service commission; resigned 1885. D. Dec. 24, 1900.

Eaton, EDWARD DWIGHT, D. D., LL. D.: clergyman; b. at Lancaster, Wis., Jan. 12, 1851; graduated at Beloit College, Wisconsin, 1872, and at Yale Theological Seminary 1875; pastor of Congregational church, Newton, Ia., Dec., 1876–Dec., 1879; became pastor of Congregational church at Oak Park, a suburb of Chicago, Ill., Jan. 1, 1880; president of Beloit College, Wisconsin, 1886–1901.

Eaton, GEORGE WASHINGTON, D. D., LL. D.: scholar and Baptist minister; b. at Henderson, Huntingdon co., Pa., July 3, 1804; educated at Ohio University and Union College, Schenectady, N. Y. (B. A. 1829); fellow and tutor at Union College 1829–30; Professor of Ancient Languages in Georgetown College, Kentucky, 1831–33; Professor of Mathematics and Natural Philosophy at the Literary and Theological Institution, Hamilton, Madison co., N. Y., 1833–37; Professor of Ecclesiastical and Civil History 1837–50; Professor of Systematic Theology 1850–61; president of Madison University 1856–68; president of Hamilton Theological Seminary and Professor of Homiletics 1861–71. D. in Hamilton, N. Y., Aug. 3, 1872.

Eaton, JOHN, Jr., Ph. D., LL. D.: educator; b. at Sutton, N. H., Dec. 5, 1829; graduated at Dartmouth in 1854; superintendent of public schools, Toledo, O., 1856–59; studied theology at Andover (Mass.) Theological Seminary 1859–61; ordained by the Maumee (O.) Presbytery 1861; served as chaplain during the war, rising to the rank of brevet general of volunteers; established and edited the *Daily Post* at Memphis, Tenn., 1866–70; State superintendent of public instruction for Tennessee 1867–69; secretary of the board of visitors to the West Point Military Academy 1869; was U. S. commissioner of education 1870–85; president of Marietta College, Ohio, 1885–91; appointed superintendent of public schools in Puerto Rico in Jan., 1899.

Eaton, JOHN HENRY: politician; b. in Tennessee in 1790; elected to the U. S. Senate as a Democrat and served till 1829; was the personal friend of Andrew Jackson, who made him his Secretary of War 1829–31. He was afterward Governor of the Territory of Florida, and in 1836 was appointed minister to Spain. He published a *Life of Andrew Jackson* (Philadelphia, 1824). D. at Washington, Nov. 17, 1856. His name will always be remembered in connection with the "Eaton scandal," in which his wife, MARGARET L. O'NEILL EATON, figured on his appointment to a seat in the cabinet. Unfavorable reports of her reputation caused the ladies of Washington official society to refuse her the recognition which her position as the wife of a cabinet officer demanded. President Jackson espoused her cause with more zeal than discretion; the controversy assumed a political character, and became so bitter as to bring about a disruption of the cabinet in 1831.

Eaton, THOMAS TREADWELL, A. M., D. D., LL. D.: Baptist minister, editor, and author; b. Nov. 16, 1845, at Murfreesboro, Tenn., and educated at Union University, Tennessee, Colgate University, New York, and Washington and Lee University, Virginia. He has been assistant Professor of Mathematics at Washington and Lee University; Professor of Mathematics at Union University; pastor of the Baptist church at Lebanon, Tenn.; pastor of the Baptist church at Chattanooga, Tenn.; pastor of the Baptist church at Petersburg, Va.; and is now pastor of the Walnut Street Baptist church, Louisville, Ky., and editor of the *Western Recorder*. He has published *The Angels* (1876); *Talks to Children* (1888); *Talks on Getting Married* (1891).

W. H. WHITSITT.

Eaton, WYATT: figure and portrait painter; b. at Philipsburg, Canada, May 6, 1849. Pupil of Gérôme. His portraits are excellent in character and arrangement. He exhibited two of the best of them, those of Timothy Cole, the engraver, and of Mrs. R. W. Gilder, at the Paris Exposition 1889. He was one of the founders of the Society of American Artists. D. at Newport, R. I., June 7, 1896. W. A. C.

Eaton Rapids: city; Eaton co., Mich. (for location of county, see map of Michigan, ref. 7–I); on Mich. Cent. and Mich. So. R. Rs., and on Grand river, 24 miles N. N. W. of Jackson. It has 4 churches, 4 brick school-houses, a large apple-evaporator, ax-factory, furniture-factory, and 3 saw-mills. It is the market-center of a rich farming district, and is noted for its mineral magnetic springs, visited annually by hundreds. Pop. (1880) 1,785; (1890) 1,970; (1900) 2,103. EDITOR OF "JOURNAL."

Eatonton: city; on railway; capital of Putnam co., Ga. (for location of county, see map of Georgia, ref. 3–H); situated in a cotton-producing region, 21 miles N. N. W. of Milledgeville. Pop. (1880) 1,371; (1890) 1,682; (1900) 1,823.

Eau Claire, ō′klār′: city and railway center; capital of Eau Claire co., Wis. (for location of county, see map of Wisconsin, ref. 4–C); situated at the confluence of Eau Claire and Chippewa rivers; has a private academy for girls, a high school, numerous sawmills and planing-mills, a flouring-mill, grain elevators, iron and brass foundries, paper-mill, sash, door, and blind factory, furniture-factory,

manufactories of boots and shoes, pearl buttons, electric dynamos and machinery, electric lights, and street railways. The annual lumber output is from 250,000,000 to 300,000,000 feet. It is one of the chief commercial cities of Northwest Wisconsin. Pop. (1880) 10,119; (1890) 17,415; (1900) 17,517.

EDITOR OF "FREE PRESS."

Eau de Cologne, ō′de-kō′lōn′, or **Cologne Water**: a celebrated liquid perfume invented by Farina of Cologne, where large quantities of it are prepared. It is also made in France and almost all other countries. The following recipe affords a good imitation of the original article: Take of alcohol 1 pint; of the oils of bergamot, orange peel, and rosemary, each 1 drachm; of bruised cardamom seeds, 1 drachm; orange-flower water, 1 pint: distill 1 pint from a water-bath.

The secret of the composition of true cologne has been carefully preserved by the Farina family, and the different business-houses of Cologne bearing the name of Farina prepare perfumes which are by no means identical in odor. One of the family is reported to have published in 1863 the following as the formula for genuine eau de cologne: Take of oil of lavender 4 oz.; purified benzoin, oil of rosemary, each 2 oz.; strong alcohol, 9 gal.; dissolve the oil and benzoin in the alcohol, and to the solution add successively oil of neroli, oil of young orange (*huile des petits grains*), oil of lemon, each 10·4 oz.; oil of sweet orange, oil of lime peel, oil of bergamot, each 20·8 oz.; tincture of rose-geranium flowers, a sufficient quantity. Macerate for several weeks, and then bottle the mixture. There are hundreds of recipes, many of which are vouched for as the genuine, but all, no matter how complicated the formula, are simply aromatized alcohol. It is essential that the alcohol be perfectly deodorized and freed from fusel oil before use.

There is a class of cologne-water obtained by macerating aromatic substances in alcohol for some time, and then distilling the whole. But these waters require to be allowed a few months of rest to develop their better qualities. It is probable that the original article was of this class. Good colognes have a rich and permanent odor, not clearly alcoholic. Not one of the essential oils employed should be recognizable by the sense of smell. The best brands have long borne the name of Jean Maria Farina, and there are many claimants to the original proprietorship of the name.

Eau de Javelle, ō′de-zhaă′vel′, or **Javelle's Solution**: a chlorinated solution of potash, analogous to Labarraque's solution of soda. It has bleaching and disinfecting properties, and is employed in removing fruit-stains, etc., from linen. When swallowed in considerable quantity it has poisonous effects.

Eau de Vie, ō′de-vee′: the French for BRANDY (*q. v.*).

Eaux Bonnes, ō′bŭn′ (i. e. good waters): a fashionable resort of France; department of Basses-Pyrénées; 22 miles S. of Pau (see map of France, ref. 9–D). Here are warm sulphur-springs, which are especially efficacious for disorders of the lungs and chest. Pop. (1896) 775.

Eaux Chaudes, ō′shōd′: village of France; department of Basses-Pyrénées; 2 or 3 miles S. W. of Eaux Bonnes; about 25 miles S. by W. of Pau (see map of France, ref. 9–D); has warm medicinal springs. The waters have a wide range of usefulness in the diseases of the lungs, joints, and skin.

Eaves [O. Eng. *efes*: O. H. G. *obasa*, eaves, porch, probably from same root as Germ. *über*, Eng. *over*; cf. Gr. *ὑπέρ*. The word is properly of the singular number]: in architecture, the lowest edges of the inclined sides of a roof, which project beyond the face of the wall, so as to throw off the water from the roof. The eaves are sometimes provided with a gutter and a downpipe or "leader" to carry off the water, which otherwise would be driven against the walls by the wind.

Ebal: See GERIZIM.

Ebel, ā′bel, HERMANN WILHELM: linguist; b. in Berlin, Germany, May 10, 1820; became in 1858 professor at the gymnasium in Schneidemühl; was professor at Berlin from 1872. He published, among other works, a new edition of Zeuss's *Grammatica Celtica* (1871), and many essays in the *Zeitschrift für vergleichende Sprachforschung*, and in Kuhn's and Schleicher's *Beiträge zur vergleichenden Sprachforschung*, some of which have been translated into English under the title *Celtic Studies* (1863). D. at Misdroy, Wollin island, Aug. 19, 1875.

Ebel, JOHANNES WILHELM: divine; b. at Passenheim, Prussia, Mar. 4, 1784; educated at Königsberg, where he became preacher and teacher; was accused of heresy and of founding a sect on grossly immoral principles, and although completely acquitted in two different trials was deprived of his pastorate and died in retirement at Ludwigsburg, Aug. 18, 1861. See his *Life* by J. I. Mombert (New York, 1882).

Ebeling, ā′be-ling, CHRISTOPH DANIEL: scholar and writer; b. in Hildesheim, Germany, Nov. 20, 1741. He devoted himself chiefly to geographical studies, and for his great work, *Geography and History of North America* (Hamburg, 5 vols., 1793–99), he was thanked by the Congress of the U. S. His valuable collection of books and maps relating to this subject was purchased in 1818 by Israel Thorndike, and presented to Harvard College. D. in Hamburg, June 30, 1817.

Eb'ensburg: borough; on railway; capital of Cambria co., Pa. (for location of county, see map of Pennsylvania, ref. 5–D); 26 miles W. of Altoona; has sawmills, woolen-mills, and tanneries. Pop. (1890) 1,202; (1900) 1,574.

Eberhard, CHRISTIAN AUGUST GOTTLAB: poet and savant; b. at Belzig, Prussia, 1769; was at first a student of theology at Leipzig, but afterward devoted himself to literature. In the fields of fiction and poetry he was very successful. D. at Dresden, May 13, 1845. His collected *Works* fill twenty volumes, but he is best known in the literary world as the author of the idyl *Hannchen und die Küchlein* (1822) and of a long poem in hexameters called *Der erste Mensch und die Erde* (1828).

Eberhard, ā′ber-haărt, JOHANN AUGUST, D. D.: philosopher; b. in Halberstadt, Prussia, Aug. 31, 1739; studied theology at Halle; gained distinction as an elegant writer, and became Professor of Philosophy at Halle in 1778. He was a rationalist in theology, and an adversary of Kant in philosophy. Among his best works are an apology for Socrates, *Neue Apologie des Sokrates* (2 vols., Berlin, 1772; 3d ed. 1788); a theory of the fine arts and sciences, *Theorie der schönen Künste und Wissenschaften* (1783; 3d ed. 1790); a general history of philosophy, *Allgemeine Geschichte der Philosophie* (1788); and an excellent dictionary of German synonyms, *Synonymisches Handwörterbuch der deutschen Sprache* (Halle, 1802; 13th ed. by Lyon and Wilbrandt, Leipzig, 1882). D. in Halle, Jan. 6, 1809.

Eberhard, KONRAD: sculptor and painter; b. in Bavaria, Nov. 25, 1768; became Professor of Sculpture in the Academy of Munich in 1816. He is best known as one of the followers of the religious or Catholic revival in art, of which Overbeck was the leader. Among his works are statues of St. George and St. Michael. His best works are in Munich. D. in Munich, Mar. 12, 1859.

Eberhard im Bart: the first Duke of Würtemberg; b. Dec. 11, 1445; became count of a part of Würtemberg when only fourteen years old, and led a dissipated life; but reformed after a voyage to Palestine, and became one of the most popular princes of Germany. He visited Italy, where he met the leading scholars of the age, and on his return fostered the spirit of the new learning in his own state. He founded the University of Tübingen in 1477. Having consolidated his part of Würtemberg with that of his cousin, the emperor created him in 1495, in consequence of his services to the empire, Duke of Würtemberg. As a ruler, he was wise and liberal; his agreement to a limitation of the ducal prerogative was the foundation of the constitution of Würtemberg. D. in Tübingen, Feb. 24, 1496. See Pfister, *Eberhard im Bart, erster Herzog in Würtemberg* (1822).

Ebernburg, ā′bern-boorkh: a small town of the Palatinate, Bavaria; on the river Nahe; 20 miles S. W. of Mentz (see map of German Empire, ref. 6–D). Here is an old ruined castle which belonged to Franz von Sickingen, and was used as a place of refuge by Melanchthon and other reformers.

Ebers, ā′bers, GEORG MORITZ: Orientalist and novelist; b. at Berlin, Mar. 1, 1837; lectured since 1865 in Jena on the language, history, and monuments of ancient Egypt, and became in 1870 Professor of Egyptian Archæology in Leipzig. His chief work is a *Commentary on the Books of Moses* (Die Bücher Mosis; Sachlicher Commentar zu Genesis und Exodus, vol. i., 1868). He also published an essay in Virchow and Von Holtzendorf's collection, *Hieroglyphisches Schriftsystem* (1871); *Durch Gosen zum Sinai*, an account of his travels in Palestine (1872); and *Papyrus E.*,

ein hieratisches Handbuch der ägyptischen Medizin (1874). In 1864 Ebers had turned aside for a time from his scientific pursuits to write a novel, *Eine ägyptische Königstochter* (The Daughter of an Egyptian King). In 1877 a severe lameness induced him to try his hand once more at this less severe kind of writing. He published *Uarda* (1877); *Homo Sum* (1878); *Die Schwestern* (The Sisters, 1880); *Der Kaiser* (The Emperor, 1881); *Serapis* (1885); and other works of fiction, all of which had great success. D. in Aug., 1898. Revised by A. R. Marsh.

Ebert, ā'bert, Adolph: Romance philologist; b. in Cassel, Germany, June 1, 1820; became in 1862 Professor of Romance Languages and Literature at Leipzig. He made many useful contributions to the history of literature in the Romance countries of Europe, especially in the *Jahrbuch für rom. und engl. Literatur*, of which he was one of the founders, in 1859. He will perhaps be longest remembered for his admirable *Geschichte der Literatur des Mittelalters im Abendland*, of which he concluded, however, little more than the review of Latin literature in the Middle Ages (2d ed. 3 vols., 1880–89). D. July 1, 1890. A. R. Marsh.

Ebert, Karl Egon: poet; b. in Prague, Bohemia, June 5, 1801; became librarian to the Prince of Fürstenberg, at Donaueschingen, 1825, holding this and other administrative offices till 1857, when he went into retirement and devoted himself exclusively to literature. He wrote tragedies, dramas, and epics, but his lyric poetry shows his talent to the best advantage. Among his works are *Bretislaw und Jutta*, a drama (Prague, 1835); *Wlasta*, a national heroic poem of Bohemia; the idyl, *Das Kloster*, and his *Gedichten* (1828). D. in Prague, Oct. 24, 1882.

E'bionites [Heb. *ebion*, poor]: a name given at first to all Christians on account of their poverty; then given by Gentile Christians to Jewish Christians; and finally restricted to heretical Jewish Christians. Irenæus (between 182–188 A. D.) is the first to mention the Ebionites by name, though they are thought to be the "hereties" spoken of by Hegesippus some years earlier. The Pharisaic, or the older Ebionites, rejected the writings of Paul and expressed the greatest hatred of him and his opinions, insisted upon the observance of the Mosaic ritual, and were humanitarians and millenarians. They had a recension of the Gospel of Matthew, which they termed "the Gospel according to the Hebrews," and which omitted all allusion to Christ's supernatural birth. To them Christ was a mere man. The Essenic Ebionites, who came up later under Gnostic influences, were more speculative and ascetic, although they practiced marriage. They identified Christianity with primitive Mosaism, and made out of Christ a prophet. They produced the Clementine literature. Ebionism showed life in any force only for a hundred years, never had any considerable influence, yet lingered till about the middle of the fifth century. See R. A. Lipsius, *Die Quellen der ältesten Ketzergeschichte* (Kiel, 1875). Revised by S. M. Jackson.

Eb'onite [so called in allusion to its resemblance to ebony]: a hard black compound obtained by blending caoutchoue with variable proportions of sulphur, generally about half its weight. It is called vulcanite in the U. S.

Ebony [from Lat. *e'benus*, Gr. ἔβενος; prob. a Semitic loan-word]: a name given to a number of tropical or warm-temperate woods. The large part of the ebonies are from the Old World tropics, and they are mostly members of the *Ebenaceæ* or Ebony family. The true ebony belongs to two species of *Diospyros*, *D. embryopteris* and *D. ebenum*. The former grows in India and the latter in Ceylon. *Diospyros melanoxylon* of India and several other species also yield commercial ebony. The "green ebony" of Jamaica is the wood of *Brya ebenus*, a tree of the *Leguminosæ*, which is also known as "cocus-wood." The beautiful Calamander-wood (*q. v.*) is also a species of *Diospyros*. Ebony is a hard and very dense wood, aromatic—particularly when burned—and capable of taking on a high polish. It is ordinarily heavier than water, and of a deep black color. It was known to the Romans. The genus Diospyros (*q. v.*) is widely distributed, and its wood is everywhere characterized by some or all of the qualities which are present in the ebony of commerce. Two species are native in the U. S. L. H. B.

Eboracum: See York.

Ebrard, ā'brärt, Johann Heinrich August: Protestant theologian; b. at Erlangen, Germany, Jan. 18, 1818; studied there and at Berlin; became Professor of Theology at Zurich 1844, at Erlangen 1847, consistorial councilor in Spires 1853, and resigned professorship in 1861; became pastor of the French Reformed Church at Erlangen 1875. He was a prominent representative of the orthodox school. Among his works are *Christliche Dogmatik* (2 vols., 1852; 2d ed. 1863); *Praktische Theologia* (1856); *Peter Lotich der jüngere* (2d ed. 1883). D. at Erlangen, July 23, 1888.

E'bro, Span. pron. ā'brō (anc. *Ibe'rus*; Fr. *Èbre*): a river of Spain; rises in the Cantabrian Mountains near the northern boundary of the province of Burgos. It flows nearly southeastward through the provinces of Navarre and Saragossa, forms the boundary between Huesca and Teruel, and enters the Mediterranean 22 miles E. of Tortosa. The delta at its mouth is crossed by a canal. The chief towns on its banks are Logroño, Tudela, Saragossa, and Tortosa. Its whole length is about 440 miles. Its navigation is rendered difficult by rapids and rocks. A canal extends along the Ebro from Tudela to Sastago, 40 miles below Saragossa.

Ebullioscope, ĕ-bŭl'li-ō-skōp [from Lat. *ebulli're*, boil + *scope*, from Gr. *-σκοπος*, observing]: an instrument for ascertaining the strength of alcohol or other distilled liquids by indicating the boiling-point and the barometrical pressure at the time of the experiment. These instruments are of various kinds; those of Vidal and of Conatty are the best known.

Ebullition, eb-ŭl-li'shŭn [from Lat. *ebulli'tio*, deriv. of *ebulli're*, boil up]: boiling; the violent agitation into which liquids are thrown by the rapid escape of their vapor when sufficiently heated. Before ebullition begins, if sufficient heat is applied, the temperature of the liquid continually rises; but when the liquid reaches the "boiling-point"—the point at which ebullition is seen—the temperature is constant. Ebullition occurs at the temperature at which the vapor tension of the liquid in question is sufficient to overcome the pressure to which the bubbles are subjected. See Boiling-point.

Ecbat'ana, or **Agbatana** (in Fr. *Ecbatane*): a celebrated ancient city; the capital of Media; situated near the base of Mt. Orontes (*Elwend*), about 165 miles S. W. of Teheran. Its foundation is attributed by tradition to Semiramis, but according to Herodotus it was founded by Deïoces 708 B. C. It stood on a conical hill, and was surrounded by seven concentric walls, each of which was higher than the next outer one. It was the favorite summer residence of the kings of Media and Persia, who had here a magnificent palace and a citadel of immense strength. Alexander the Great captured it in 331 B. C., and obtained a very large booty. After this it became a mere provincial town till the time of the Parthians, when it was again the summer residence of kings. Nothing is heard of it in history after its conquest by the Sassanidæ. This city is called *Achmetha* in the book of Ezra. Some recent writers believe it to be the modern Hamadân (*q. v.*). Rawlinson attempts to identify it with the ruined *Takht-i-Soleimán*.

Eccard, Johannes: musical composer; b. in Mühlhausen, Prussia, 1553; studied at Munich under Orlando Lasso; returned in 1574 to Mühlhausen, where he edited with von Burgk a collection of sacred songs. In 1595 he became chapel-master at Königsberg, and in 1608 was called to Berlin as chief conductor of the elector's chapel. Eccard composed exclusively vocal music. His compositions are remarkable for their deep religious feeling as well as for the extraordinary skill which they reveal as works of art. D. in 1611.

Ecce Homo, ek'sā-hō'mō [Lat., behold the man]: the words uttered by Pilate (John xix. 5) when he brought Jesus forth to the people. Monkish tradition points out the spot, now marked by an arch called *Ecce Homo*, only the piers of which appear to be ancient. It spans the *Via Dolorosa* at its highest point, and has "a narrow gallery or chamber on the top." "Ecce Homo" is the name given to pictures of Christ crowned with thorns. Correggio's, in the National Gallery, London, is generally considered the best.

Eccentric [from Gr. ἔκκεντρος, out of the center; ἐκ, out of + κέντρον, center]: in machinery, a device by which circular motion gives rise to "to-and-fro" motion. In one of the forms of the eccentric a disk is made to revolve around a point not in its center. The disk turns in a metallic collar, which is thrown back and forth by the revolutions, and to the collar a rod is attached which receives the required to-and-fro motion. This arrangement is often used to give motion to sliding valves in steam-engines.

Ecchelensis, Abraham: See Echellensis, Abraham.

Ecclesfield: township of the West Riding of Yorkshire, England; 5 miles N. of Sheffield (see map of England, ref. 7–H). It has manufactures of cutlery, linen, and nails. Coal and iron mines are worked in the vicinity. Pop. (1891) 25,890.

Ecclesia [Gr. *ἐκκλησία*, assembly, deriv. of *ἐκκαλεῖν*, call forth]: the great assembly of the Athenians, in which every free citizen might vote. Although possessing supreme authority in the state from a very remote period, it was after a time seldom convened, so that the management of the state fell into the hands of the archons, who were elected from the nobles. Solon afterward appointed it to meet four times every thirty-five days. This was the ordinary ecclesia. The extraordinary assembly, called the cataclesia, was convened on occasions of unusual importance by special messengers to the people. The subjects discussed in the ecclesia were restricted by Solon to such as had passed through the senate of five hundred, but this rule was not strictly observed. The magistrates who managed these assemblies were the prytanes, proedri, and epistates: the first convened the people, the second proposed the subjects on which they were to decide, the third presided over the whole. The name ecclesia was afterward given generally to any public assembly regularly convoked.

Ecclesias'tes [Gr. *ἐκκλησιαστής*, member of an *ἐκκλησία*, assembly; used in Septuagint to translate the Heb. *qōhéleth*, which the English versions translate preacher]: a canonical book of the Old Testament. Its author writes in the person of "Qoheleth," who is described as king in Jerusalem and son of David—i. e. Solomon. Since the time of Grotius (1644) the Solomonic origin of the book has been denied by continental critics generally, even by orthodox writers like Hengstenberg, Keil, and Delitzsch, the dates assigned ranging from 536 to 150 B. C. Its post-Solomonic origin has been argued (1) from its distinctly neo-Hebraic linguistic character; (2) from the sentiments expressed. On the other hand, the ascription of the book to Solomon has been defended by such scholars as Schelling, Van Essen, Hahn, Pusey, Wordsworth, and Tayler Lewis. The old Jewish tradition ascribes it to the men of Hezekiah. The two leading ideas of the Preacher are the vanity of earthly good and the certainty of judgment. The alleged epicureanism of several passages, so much emphasized by some critics, is thought by others to be simply ironical. In any case it presents no teachings that are peculiar to the followers of Epicurus, but only such as are common to them and earlier teachers. For the literature, which is very abundant, see commentary by Ginsburg (London, 1857). See the commentaries by E. H. Plumptre (in *Cambridge Bible*) and S. Cox (1890). Revised by Willis J. Beecher.

Ecclesiastical Commissioners: in England and Wales, the archbishops, bishops, the principal deans, several of the principal judges, the chief baron of the exchequer, the master of the rolls, and twelve lay members, all ehnrchmen, who are appointed for the purpose of examining the state of dioceses and the episcopal revenues, of uniting or dividing parishes (when expedient), and of carrying out other measures for the benefit of the Established Church. The commission was established in 1835.

Ecclesiastical Courts: courts in which ecclesiastical causes are tried. See Courts.

Ecclesiastical History: See Church History.

Ecclesiastical Law: See Canon Law.

Ecclesias'ticus [from Gr. *ἐκκλησιαστικός*, pertaining to the *ἐκκλησία*, assembly, ehurch], or **the Wisdom of Jesus the Son of Sirach**: a book eonsidered apocryphal by Jews and Protestants, but reeeived as canonical by the Roman Catholic and Greek Churches. By the Anglican Articles it is recommended to be read for edification. It appears to have been written in Hebrew at Jerusalem, either about 200 or about 300 B. C. See Pseudepigrapha.

Ecdysis: See Entomology.

Echegaray, José: dramatist and statesman; b. in Madrid, Spain, in 1835; since 1858 Professor of Mathematics and Physics in the Engineering School in Madrid. In this capacity he has published several mathematical and scientific works of value. He has also been prominent in political affairs, being Minister of Commerce in 1868, Minister of Public Instruction in 1873, and Minister of Finanees in 1874. It is as a dramatist, however, that he is chiefly known, even in Spain. His themes are almost invariably tragic ones, and his endeavor is to show the terrible consequences of sin. It must be admitted that he often produees a deep effect; yet oftener, perhaps, the excessive emphasis of his style, his high colors, and his inability to be simply direct, repel the speetator. His first success as a playwright was obtained by *La Esposa del vengador* (1874). Sinee then he has produced many dramas, the most noteworthy being *O locura o santidad* (1878); *El Gran Galeotto* (1881); *Conflicto entre dos deberes* (1885); *Vida alegre y muerte triste* (1887).

A. R. Marsh.

Echellensis, ek-el-len'sis, Abraham: a learned Maronite; b. at Eekel, in Syria. He was Professor of Arabic and Syriac at Rome, and removed abont 1630 to Paris, where he assisted in the editing of Le Jay's polyglot Bible. He was the author of a history of the Council of Nicæa from Oriental sources, and of an *Oriental Chronicle*. D. in Italy in 1664.

Echelon, esh'e-lon [Fr. *échelon*, *échelle*, ladder: Ital. *scala*; Span. *escala* < Lat. *scala*, steps]: in military tactics, an arrangement of troops when several divisions are drawn up in parallel lines, eaeh to the right or the left of the one preceding it, like "steps," so that no two are on the same alignment. Each division by marching direetly forward can form a line with that which is in advanee of it.

Echeneididæ, ek-e-neĕ-id'i-deĕ [deriv. of *echeneis* = Gr. *ἐχενηίς*, ship detaining, name of a fish; *ἔχειν*, hold + *ναῦς*, ship]: a family of fishes of the order *Acanthopteri* and suborder *Discocephali*, particularized by the development of a broad oval sucking-disk on the top of the head. The body is more or less elongated, and the scales very small and imbedded in the skin; the head very depressed; the mouth is moderate, and the lower jaw projects eonsiderably beyond the upper; the dorsal fin exhibits, in part, a perfectly anomalous structure—viz., the anterior portion, instead of being a fin, is developed into the broad oval disk characteristie of the group; by means of this disk the fishes are enabled to adhere to various objects; the posterior portion of the dorsal is normally developed as a true rayed fin. The fishes eomprised in this family are among the most singular of the class, and are familiar to all seafaring people. By sailors and shoremen they are generally designated as suckers; but this name is given to so many different animals that, unfortunately, it is not at all characteristic, although so applicable in other respects to the species. Their peculiar aspect and the depression of their head induce persons unfamiliar with ichthyology to believe that the back is the abdominal surfaee, and, *vice versa*, that the belly is the true back. They are sluggish in their movements, and depend for transportation rather upon others than their own exertions. They are to a large extent commensals, or parasitic upon other fishes, and, to a eonsiderable degree, they seem to restrict their attentions to special animals. Thus, of the common speeies, one (*Remora remora*) chiefly attaches itself to large sharks (*e. g. Eulamia*, *Galeocerdo*, etc.), and another (*Echeneis naucrates*) is partial to the sea-turtles. These are the most common; the others are more limited and much rarer. The more notable are *Remoropsis brachyptera*, which is a parasite of sword-fishes, and *Phtheirichthys lineatus*, which is parasitic upon the barraeuda (a large *Sphyræna*). See also Sucker and Discocephali.

Revised by D. S. Jordan.

Echenique, José Rufino: soldier and statesman; b. at Puno, Peru, 1808. When a mere boy he joined the patriot army, and was taken prisoner by the Spaniards. In 1833, when a colonel, he induced the troops which had revolted under Gamarra and Bermudez to return peacefully to their allegiance, an event whieh is known as the "Embrace of Maquinhuayo." He served on the side of Santa Cruz at the battle of Yungay (Jan., 1839), but subsequently made his peace with the victor, Gamarra. In 1843 he declared against Vivanco at Xauxa, and in 1845 he was a member of Castilla's council of state. On Apr. 20, 1851, he was elected president of Peru. At first his term promised to be peaceful, but in 1853 charges of extravagance and irregularities in the finances were made against him, and Domingo Elias headed a revolt which was ended by the battle of Saraja, Jan. 7, 1854. A second revolt, led by Castilla and Elias, resulted in Eehenique's defeat at the bridge of Iseuchacha, in the valley of Xauxa, Aug. 2, 1854; he retired to Lima, but after several days of hard fighting before the city was again defeated at the battle of La Palma, Jan. 5, 1855, and driven from the country. He was allowed to return as a private citizen in 1862, took part in the Spanish war 1866, and was again a presidential candidate in 1872. D. at Arequipa, Oet. 18, 1879.

Herbert H. Smith.

Echeverría, Estéban: poet; b. in Buenos Ayres, 1809. His first poem, *Elvira*, published in 1832, was followed in 1834 by *Consuelos*, a collection mainly of lyrics, and later by *Rimas*, another collection, and *La Cautiva*, his principal work. He was banished by Rosas to Montevideo, where he died in 1851. Echeverría's works were republished in five volumes in 1874; they are very popular throughout Spanish America. H. H. S.

Echeverría, Francisco Javier: statesman; b. in Jalupa, Mexico, July 25, 1797. He inherited a large commercial business from his father, carrying it on first in Vera Cruz and after 1834 in Mexico. In 1829 he was a deputy to congress, and later was several times minister of the treasury (1834, 1836, and 1837 to 1841). In the latter year he was, for a short time, acting president during the absence of Bustamente. He was again deputy in the congress of 1850–51. D. in Mexico, Sept. 17, 1852. H. H. S.

Échevin, ā'she-văñ' [Fr. *échevin*: Ital. *schiavino*: Span. *esclavin*, a Teuton. loan-word, O. H. Germ. *skeffino* > Mod. Germ. *Schöffe*]: in France from the time of Charlemagne to the Revolution (1789), a royal officer of justice and of finance, whose duties were various in different periods. For the last six hundred years of the duration of the office it was chiefly exercised in the cities. The échevins of Paris were assessors, and had authority as magistrates in some kinds of civil business.

Echidna, ĕe-kid'na [Gr. ἔχιδνα, serpent]: in Greek mythology, a monster, half serpent and half woman; according to Apollodorus, the daughter of Tartarus and the mother of Cerberus, the Chimæra, and other monsters. See Pausanias, 8, 18.

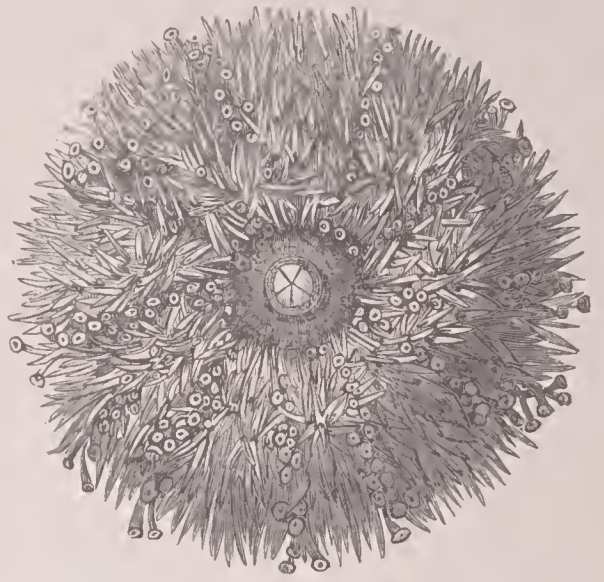
Echidna: a genus of quadrupeds belonging to the order *Monotremata*, having a long slender muzzle, toothless jaws, powerful long-clawed feet, and strong sharp spines thickly set in long thick fur. The animals of this genus are related to the duckbill (*Ornithorhynchus*), and, like it, lay eggs. They burrow in the earth, and feed on ants and other insects, whence they are sometimes called spiny ant-eaters. They are from a foot to a foot and a half long, but a related animal from New Guinea, *Zaglossus* or *Prœchidna bruijnii*, is much larger. *Echidna setosa* is from Van Diemen's Land, *E. aculeata* from Australia, and *E. lawesii* from New Guinea. The name *Echidna* is preoccupied in zoölogy, and the name *Tachyglossus* should be used for these animals.
F. A. Lucas.

Echimys, ĕe-kī'mis [abbrev. for *echinomys*; Gr. ἐχῖνος, hedgehog + μῦς, mouse]: a genus of South American rodent mammals called "spiny rats." They are about the size of large rats, and have numerous flattened spines scattered through their hair. There are six or eight species.

Echinades, ĕe-kin'a-dēez [Gr. Ἐχινάδες, also called Ἔχῖναι, as if named from ἐχῖνος, hedgehog]: the ancient Greek name of a group of islands of the Ionian Sea, off the mouth of the Achelous. Some of the ancient islands have been joined to the mainland by alluvial deposits. The islands are small, rocky, and unimportant. Seventeen have names, but only nine are cultivated. They are now called Kurtzelari islands, and the largest is named Petalá; but Oxiá, Makrí, and Vrómona are the most important. Lat. of the S. end of Oxiá, 38° 17′ N., lon. 21° 6′ E.

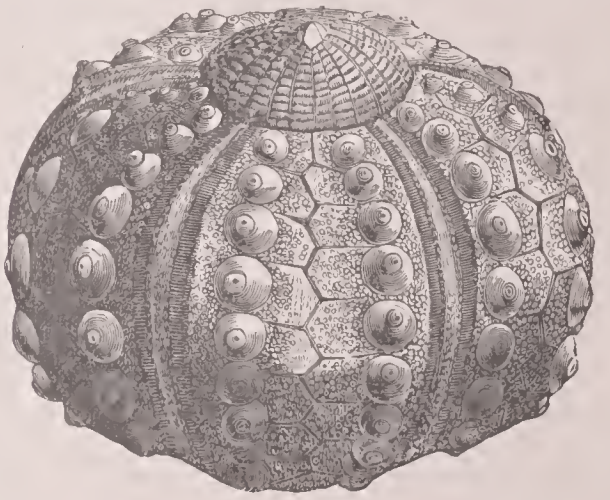
Echinoder'mata [from Gr. ἐχῖνος, hedgehog + δέρμα, -ατος, skin]: the echinoderms, considered as a grand division of the animal kingdom. They were formerly classed with the Cœlenterates as Radiates, from the fact that their parts (in multiples of five) radiate from a central axis. They have an external calcareous skeleton, often covered with spines, an alimentary canal distinct from the body cavity (see Cœlenterata), a radiate nervous system, and a peculiar "water vascular" system, which in some forms is connected with a unique system of locomotor tube feet or ambulacra. They reproduce by eggs (the sexes being separate), and the larvæ in most forms are bilaterally symmetrical, without any trace of the radiate structure so typical of the adults. In some instances these larvæ are characterized by the development of long arms, sometimes stiffened by a slender internal rod of carbonate of lime. At the time of metamorphosis these arms are absorbed, and the new animal forms around the throat of the old, the water vascular system apparently taking the initiative in the metamorphosis. Fossil Echinoderms occur in the Silurian and all later rocks. Some live on animals, others on plants; all are marine. Their relationships to other forms are obscure. The branch Echinodermata is divided into Crinoidea, Asteroidea, Starfish, Ophiuroidea, Echinoidea, and Holothurioidea (*qq. v.*). J. S. Kingsley.

Echinoidea [from Gr. ἐχῖνος, a hedgehog + εἶδος, shape]: a class of Echinodermata popularly known as **Sea-urchins**, or sea-eggs. The typical forms are flattened spheres, with



Sea-urchin showing the spines, tube feet, and the five jaws.

mouth at one pole and vent at the other. The outer wall of this sphere is made up of ten rows of calcareous plates, one series being covered with spherical knobs, on which are



Sea-urchin with the spines removed.

articulated with a ball-and-socket joint the hardened spines which form a part of the animal, the other series being perforated by minute holes, through which pass the peculiar ambulacra or tube feet by which the animal moves. In all, except the heart-urchins, the mouth is armed with five teeth, which meet in the center, and which sharpen themselves like those of the squirrels. A few of the Echinoids are used for food, a European species (*Echinus esculentus*) being largely eaten. Some of the tropical species have poisonous spines, which, when they penetrate the flesh, produce severe wounds. The Echinoids are divided into the regular urchins or *Cidaridea*, the cake-urchins, or *Clypeastridea*, and the heart-urchins, or *Spatangidea*. J. S. Kingsley.

Echi'nus [Gr. ἐχῖνος, hedgehog]: a genus of sea-urchins or Echinoidea (*q. v.*).

Echinus: in architecture, a convex molding or ovolo decorated with "egg-and-dart ornaments," somewhat resembling chestnuts in form. The name is also applied to the circular cushion-like member under the abacus in the Tuscan and Doric orders, whether so decorated or not.

Echiu'ridæ [Gr. ἔχις, an adder + οὐρά, tail]: a family of peculiar degenerate Chætopod annelids in which the segmentation of the body has been lost while the bristles are reduced to a pair of strong spines and (in *Echiurus*) numerous bristles at the hinder end of the body. The body cavity is large, mouth and anus sub-terminal, while the head lobe is developed into a proboscis-like organ, forked at its extremity in *Bonellia*. In the young the annelid affinities are quite marked, the larva resembling that of the regular marine Chætopods and the body showing the rudiments of fif-

teen segments. The *Echiuridæ*, which are represented on the shores of the U. S. by the genera *Echiurus* and *Thalassema*, were formerly grouped with the *Sipunculaceæ* in a division (*Gephyræa*) formerly thought to be related to the Echinoderms. J. S. Kingsley.

Echo (in Gr. 'Ηχώ): in classic mythology, a nymph who aided Jupiter in escaping the watchfulness of Juno by detaining the latter with her amusing talkativeness; but that goddess, discovering the deception, ordained that she should not be able to speak until some person had spoken to her, nor to be silent after any one had addressed her. Cherishing for Narcissus a passion which was not requited, she pined away until nothing remained of her but her voice.

Echo [Gr. ἠχώ, echo, ringing sound, cf. ἠχή, ἦχος, sound, noise, Lat. *vāgor, vāgî tus*, whining, crying]: the reflection of sound from a distant surface. Several conditions must be fulfilled before an echo can be produced. The ear must be situated in the line of the reflection; and in order that the person who emits the sound may himself hear the echo, this line must be perpendicular to the reflecting surface, but if there are several such surfaces the sound may be brought back by a series of successive reflections. The opposing surface must be at a certain distance from the ear, for if the directed and reflected sounds succeed each other with great rapidity, they are confounded. Thus vaulted caves and large rooms have a strong resonance, but produce no echo.

Sound passes through the atmosphere at the rate of about 1,125 feet in a second; hence a person placed at half that distance would hear the echo exactly one second after the sound was emitted by him. The least distance of the reflecting surface from the point whence the sound is emitted must be about 50 feet.

Unless the surface reflecting the sound is of considerable extent, the echo will be too feeble to be heard. Some concavity in the surface by which diverging rays of sound are concentrated at the point where the echo is audible is favorable, if not absolutely essential, to the production of echoes. It is a property of the ellipse that every sound proceeding from one of its foci and impinging against the curve is reflected into the other focus; whence two persons placed in the two foci of an elliptic chamber may converse with each other in a whisper, and not be heard by those who are in the other parts of the room. Thus walls or buildings approaching the elliptic form return sounds with great force and distinctness. The faintest sound is conveyed from one side of the "whispering gallery" of St. Paul's, London, to the other, but is not heard at any intermediate point. Some echoes are remarkable for their frequency of repetition. An echo in the Simonetta palace, near Milan, is said to repeat the report of a pistol sixty times. To the same kind of multiple, or repeating, echo belongs that of Killarney. The phenomenon is caused either by the occurrence of several reflecting surfaces at different distances in the direction of the sound, and with sufficient interval between them, or by two surfaces being inclined to each other in such a way as to give repeated reflections of the sound from the one to the other, like the mirrors of the kaleidoscope. The number of syllables that any particular echo will repeat depends upon the distance the sound has to traverse; an echo in Woodstock Park, England, repeats seventeen syllables.

Echo Cañon: a remarkable ravine or defile in Summit co., Utah; visible to passengers on the Union Pacific Railway; 975 miles from Omaha. It is inclosed between high vertical walls of rock of great grandeur and beauty.

Ecija, ā'thĕe-*khaa* (anc. *As'tigi*): a city of Andalusia, Spain; on the river Genil, about 50 miles E. N. E. of Seville (see map of Spain, ref. 19–D). It is well built, and has numerous churches, convents, and hospitals; also manufactures of linens and coarse woolen fabrics. On the border of the river is an *alameda* (promenade) adorned with statues and fountains. Many Roman remains are found here. The climate is so hot that Ecija is called "the frying-pan of Andalusia." The ancient *Astigi* was one of the chief towns of Hispania Bætica. Pop. (1887) 23,615.

Eck, Johann (properly *Maier*): a learned and vigorous Roman Catholic opponent of Luther: b. at Eck, Swabia, Nov. 13, 1486; was professor at Ingolstadt from 1510 until his death. His most famous encounter with Luther was at Leipzig, 1519. He prepared a German translation of the Bible as a rival of that of Luther (1537). D. at Ingolstadt, Feb. 10, 1543. See his *Life* by Th. Wiedemann, Regensburg, 1865. C. H. Toy.

Eckart, or **Eckhart**, Johannes (called *Meister Eckhart*): See Eckhart, Meister.

Eckermann, Johann Peter: author, noted as the friend of Goethe; b. at Winsen, Hanover, 1792; served in the war of liberation (1813–14), and studied at the Gymnasium of Hanover and the University of Göttingen. In 1823 his *Beiträge zur Poesie, mit besonderer Hinweisung auf Goethe* (Stuttgart) brought him to the favorable notice of Goethe, who employed him at Weimar as an assistant in editing his works. He was for several years tutor to the grand duke's son, and in 1838 was appointed librarian to the grand duchess. Goethe's will intrusted to Eckermann the publication of the poet's posthumous works, which appeared in 1832–33, and in connection with Riemer he afterward brought out a complete edition of Goethe's writings in forty volumes. But his fame rests chiefly on his *Gespräche mit Goethe in den letzten Jahren seines Lebens 1823–32* (2 vols., Leipzig, 1837), which throws much light upon Goethe's character and private life. It has been translated into many European languages. The English translations are Margaret Fuller's (Boston, 1839) and John Oxenford's (London, 1850). Eckermann died at Weimar, Dec. 3, 1854. F. M. Colby.

Eck'ersberg, Johan Frederik: landscape-painter; b. in Drammen, Norway, June 16, 1822. He belongs to the Düsseldorf school. In 1859 he established an art school in Christiania, at which many prominent Norwegian artists have been educated. Among his best pictures are *Sunrise in the High Mountains* and *The Bridal Party in the Hardangerfjord*. D. July 13, 1870. R. B. A.

Eckersberg, Kristoffer Vilhelm: painter; b. in Denmark, Jan. 2, 1783. Besides producing a large number of works, he was a teacher, and many of the most talented Danish painters of the nineteenth century were his pupils. His portrait of Thorwaldsen is famous, and he was very successful in painting naval engagements. D. from cholera, July 22, 1853. See P. H. Weilbach, *Dansk Kunstlerlexikon*. R. B. A.

Eckert, Thomas Thompson: telegrapher; b. in St. Clairsville, O., Apr. 23, 1825; in 1849 placed in charge of the telegraph-office at Wooster, O.; in 1859–61 managed a gold-mining company in North Carolina; in 1861 removed to Cincinnati, where he was placed in charge of the military telegraph-office at the headquarters of Gen. McClellan; in 1862 held a similar position in connection with the Army of the Potomac; in same year established at Washington the headquarters of the military telegraph at the War Department, and was promoted to the rank of major (brevet lieutenant-colonel 1864, brevet brigadier-general 1865); was made Assistant Secretary of War July 27, 1866, and remained in office till Feb. 28, 1867; resigned to become general superintendent of the eastern division of the Western Union Telegraph Company; in 1875 became president of the Atlantic and Pacific Telegraph Company, and in 1880 president of the American Union Telegraph Company. In 1887 he became vice-president and general manager of the Western Union Telegraph Company, and in 1893 was elected its president.

Eck'hart, Meister (Master): the greatest of the German mystics; b. in Thuringia, about 1260; was vicar of the Dominican order in Erfurt, then vicar-general in Bohemia, taught in Paris in 1311–12; became a teacher of the theological school in Strassburg, and in 1327 he became provincial in Cologne. He introduced many reforms into the monasteries, attracted great attention by his sermons, and was supposed to be connected with the Brethren of the Free Spirit. A papal bull issued soon after his death condemned twenty-eight sentences in his sermons. He has been called the "father of modern pantheism," and is regarded as one of the greatest men of the German race, and one of the deepest thinkers of all ages. D. in 1327, near the beginning of the year. A collection of his writings, as far as they have been preserved, has been published by Pfeiffer in the second volume of *Deutsche Mystiker* (1857). See the monographs on his system and character by Martensen, *Mester Eckart* (Copenhagen, 1840); by Lasson, *Meister Eckhart* (1868); also E. Sievers, *Zeitschrift für deutsches Alterthum* (15, 373–439). Revised by Julius Goebel.

Eckhel, Joseph Hilarius: numismatist; b. in Enzesfeld, Lower Austria, Jan. 13, 1737. His catalogue of the famous coin collection in the Vienna Museum has been the model of all subsequent numismatic catalogues, while the *Doctrina nummorum veterum* (8 vols., 1798) remains the

standard authority on the subject. D. May 16, 1798, in Vienna.

ALFRED GUDEMAN.

Eckmühl (in Germ. *Eggmühl*): a village of Bavaria, 13 miles S. S. E. of Ratisbon (see map of German Empire, ref. 7–F). Here on Apr. 22, 1809, Napoleon defeated the Austrian Archduke Charles, who lost 5,000 killed and wounded, besides 7,000 prisoners. The effect of this victory and of the three minor engagements from Apr. 20 to 23, inclusive, was to drive the Austrians into Bohemia and leave the road to Vienna open to Napoleon. DAVOUT (*q. v.*) received the title of Prince of Eckmühl for his conduct in this battle.

Eclampsis [from Gr. ἔκλαμψις, a shining forth], **Puerperal**: See CONVULSIONS.

Eclectic [from Gr. ἐκλεκτικός, selective, deriv. of ἐκλέγειν, to select]: selected or chosen from several others. This term was applied to philosophers who endeavored to select from the systems of various schools the true or most probable doctrines, and to combine these into a harmonious system. An eclectic spirit, it is evident, can exist or prevail only at a period of some maturity in philosophical speculation. In one sense of the word, Plato and Aristotle may be regarded as eclectics, for they both availed themselves largely of the doctrines of preceding philosophers. But in the hands of these great thinkers the *discerpta membra* are endued with a principle of vitality, and reunited as coherent parts of a harmonious system. The term eclectic is especially applied to philosophers of a later age and inferior order. Among these may be classed Epictetus, Potamon, Plutarch, and Plotinus. Among the most eminent modern eclectics, Victor Cousin, the brilliant expounder of the history of philosophy, affords a favorable specimen of the eclectic spirit.

Eclecticism (in medicine): the principles and the practice of that school of medicine which leaves the physician free to select from any and all sources remedies that will cure his patients and to reject all remedies that have been proved to be injurious. *Vires vitales sustinete*, i. e. "sustain the vital forces," has from the very beginning been the recognized principle on which all treatment has been based.

At the beginning of the nineteenth century the prevailing method of treating disease was by blood-letting and the indiscriminate use of large doses of calomel and antimony to produce purging and vomiting. It was against this depleting system of treatment that Dr. Wooster Beach, of New York, and his associates protested, not with the view of organizing a new school, but in the hope of effecting a reform. They were at once denounced by the majority of the profession for attempting an innovation on the recognized methods of practice, and thus the reformed medical school was forced into existence. Through the labors of these pioneers and their disciples the barbarous practice of blood-letting was abolished, antimony was discarded, and mercury but little used, while all schools of medicine now recognize the importance of sustaining the vital forces, and all physicians are anxious to be known as Eclectics.

In 1826 Dr. Wooster Beach established the New York Reformed Medical College, and soon after associated with himself Drs. Thomas V. Morrow and Isaac G. Jones. Recognizing the need of text-books, he published several, which compared favorably with those of the dominant school published at the time.

In 1831 Drs. Morrow and Jones, upon the invitation of Rev. Dr. Chase, then Bishop of Ohio, removed to Ohio, and organized the medical department of the Worthington University, and continued their labors for reformed medical practice till 1842, when they moved to Cincinnati and established the Reformed Medical School. Drs. Balbridge, Carr, L. E. Jones, Jordan, and B. L. Hill were associated with them as teachers, and this school was continued till 1845, when it was incorporated as the Eclectic Medical Institute.

Samuel Thomson, though contemporary with Beach, was not a fellow-laborer. It is a mistake to regard Eclecticism as an offshoot of Thomsonianism, though many Thomsonians in later years became Eclectics.

A Reformed Medical Society was organized in New York in 1827, and a second in Worthington in 1836. The National Eclectic Medical Association was organized in 1848, and held annual meetings till 1857. It was reorganized in 1870, and meets yearly. There are societies in nearly all the States and in Great Britain and Australia, which represent about 16,000 Eclectic physicians; and there are successful colleges in New York, Atlanta, Cincinnati, Indianapolis, Chicago, St. Louis, Crete, Nebraska, and San Francisco.

See *National Eclectic Medical Association Transactions*, vol. v.; *Medical Tribune*, vols. vi. and ix.; and Wilder's *History of Medicine* (New York, 1896).

ROBERT A. GUNN, M. D., EDITOR "MEDICAL TRIBUNE."

Eclipse [via Lat. *eclīp'sis*, from Gr. ἔκλειψις, deriv. of ἐκλείπειν, desert, fail, leave]: in astronomy, the obscuration of one celestial body by another, or by its shadow. Eclipses are divisible into three classes, viz.: 1, the obscuration of the sun by the moon, which is called a *solar eclipse*; 2, the obscuration of the moon by the shadow of the earth, which is a *lunar eclipse*; and 3, the obscuration of a satellite of a planet by the shadow of the primary, which is called the *eclipse of a satellite*, as distinguished from an occultation of the satellite, by which is to be understood the disappearance of the satellite behind the body of the primary.

The way in which eclipses of the sun and moon occur is so obvious to one who studies the motions of these bodies that they have been well understood from ancient times. The moon performs a revolution around the earth in about a month, and at every new moon passes nearly between the earth and the sun. If the plane of the moon's orbit coincided with that of the ecliptic, the moon would pass exactly between the earth and the sun at every new moon, and we should have an eclipse of the sun every month. The moon would also pass through the shadow of the earth at every full moon, and thus we should have a monthly eclipse of the moon. As a matter of fact, however, the moon's orbit is inclined about five degrees to the ecliptic. The result is that the moon generally passes above or below the sun at new moon, and above or below the shadow of the earth at full moon. But the orbit of the moon necessarily intersects the ecliptic at two opposite points, called nodes. If the sun happens to be near the line of the nodes at the time of any new moon, then there will be an eclipse of the sun; and if the approach takes place at full moon, there will be an eclipse of the moon.

The motion of the earth in its orbit, and of the nodes of the moon's orbit, are such that the sun seems to cross one or the other of the moon's nodes at intervals of about 173 days, or a little less than six months. Hence, as a general rule, eclipses can occur only at two opposite seasons of the year. But since the period of recurrence is less than six months, the eclipse season, as we may call it, will occur earlier and earlier in successive years. For example, in 1894 the passage of the sun over one node takes place about Apr. 1 and Sept. 20. Hence during that year an eclipse can occur only near these times. But the period when they may occur is eighteen or nineteen days earlier every year, so that in 1898 the eclipse seasons will be January and July.

It happens that the apparent angular diameters of the sun and moon are very near the same. When the moon is nearest the earth it seems a little larger than the sun; when farthest away it is smaller. Referring to Fig. 1, it will be seen that if an observer is within the dark region, between m and m', the light of the sun will be completely shut off by the body of the moon. This dark region is called the umbra. In Fig. 2 it is represented as ending at the point e. Beyond this point the moon seems smaller than the sun, and the light of the sun can never be completely cut off. Now, by a curious coincidence, it happens that this point of the umbra reaches, on the average, very near to the surface of the earth. Sometimes it will not reach the earth; at other times it will go beyond it, according to the respective distances of the sun and moon from us. If the point reaches beyond the earth's surface, then there will be a small narrow region or strip within which the sun will be totally eclipsed. As the moon moves along her orbit, this shadow sweeps along the surface of the earth through a long, narrow belt. In order to see the sun totally eclipsed, the observer must be somewhere within this belt. Maps of all the eclipses which occur are published two or three years

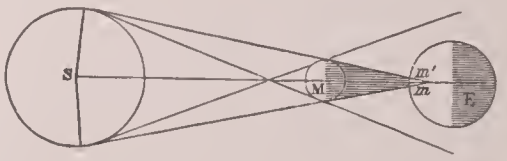


FIG. 1.

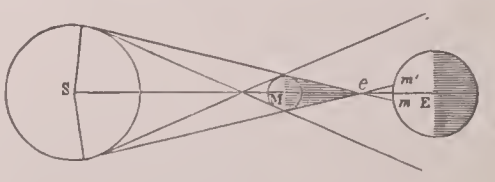


FIG. 2.

in advance in astronomical ephemerides, and by means of them an observer can see exactly at what regions of the earth's surface a total eclipse will be visible. If the shadow comes to a point before reaching the earth, as represented in the second diagram, then there will be a region, *m m'*, within which the moon will be seen projected nearly centrally on the sun, but, the apparent diameter of the sun being the larger, the edge of its disk will be seen as a ring around the dark body of the moon. This remarkable phenomenon is called an annular eclipse of the sun. As in the case of a total eclipse, the annular phase will be seen along only a comparatively narrow belt of the earth's surface.

Owing to the circumstances here described, the duration of a total or annular eclipse is always very small. That of a total eclipse ranges from a few seconds up to four or five, or even, in exceptional cases, seven minutes. The duration of an annular eclipse may be a little greater.

Total eclipses of the sun are looked forward to by astronomers with the greatest interest, because during the few minutes of their occurrence remarkable celestial phenomena can be seen which are not visible at any other time. The observer who is fortunate enough to be within the path of such an eclipse will see nothing remarkable until the sun is nearly obscured. As the moon gradually passes over the solar disk, the latter is at length reduced to a small arc of light, which becomes thinner and thinner, and at length entirely disappears. At once an extraordinary effulgence, or corona, is seen surrounding the dark body of the moon, which looks intensely black in contrast with it. An observer of the total eclipse of Aug. 7, 1869, which was visible in the U. S. from Iowa to North Carolina, thus describes the corona:

"On looking up, one of the grandest spectacles of which it is possible to conceive met the eye. Surrounding the dark body of the moon was a crown of light, with rays shooting out in five great sheaths to a distance equal to the sun's diameter, or nearly a million of miles. We gazed for eight or ten seconds with astonishment at this magnificent spectacle. No painting can represent it, and no pen can describe it."

The brightest part of the corona consists of a comparatively thin ring of white light, immediately around the dark body of the moon, and shading off quite rapidly. The light is, however, very irregular, and the most striking features of the corona are certain beams of soft, white light, which extend out in various directions like the rays from an electric light, sometimes to a distance of several diameters of the sun, or several millions of miles. Photographs of the corona which have been taken from time to time show it to consist very largely of fine lines of light, having a general form somewhat similar to the lines formed by iron filings which are scattered upon paper over a magnet. This appearance suggested to Prof. F. H. Bigelow the idea that the corona is a phenomena of polar forces resembling those of magnetism, and a complete theory of the corona has been constructed on this hypothesis.

Besides the corona, irregular patches of red light are commonly seen here and there around the body of the moon. These have long been known as protuberances, or prominences, and during the total eclipse of 1868, which was visible in India, Mr. Lockyer made the extraordinary discovery that these prominences were due principally to hydrogen gas. It was subsequently found that the whole body of the sun is surrounded by a thin layer of gases at a very high temperature, composed of vapors of several known metals, and perhaps of most of the substances which exist in large quantities on the earth, changed to vapor by the fervent heat which there prevails.

The motions of the sun and moon are such that eclipses recur approximately at an interval of 6.585 days and 8 hours, that is 18 years and 10 or 11 days, according to the number of leap-years which have occurred in the interval. This period is called the Saros. What makes it remarkable is that the time of year of the recurrences will be nearly the same, and the perigee and nodes of the moon's orbit will also return nearly to the same position, so that the eclipse when repeated will be of the same general kind. That is to say, if an eclipse of any sort is seen to-day, then by counting forward a period of one Saros, we shall have another eclipse of very nearly the same kind. Owing, however, to the number of days not being exact, eight hours being left over, the second eclipse will not be visible in the same parts of the earth as the first one was, but generally in regions about 120° farther W. in longitude. It follows that the eclipses remarkable for the duration of totality will recur at the above-named interval. By a study of the motions of the sun and moon through many centuries, it is found that one series of eclipses remarkable for long duration of totality at the present time are those of the years 1832, 1850, 1868, 1886, 1904, 1922, etc. But the duration of the eclipses of this series will continuously diminish, and after a few more periods the eclipse will cease to be total. Another remarkable series will be the eclipses of 1883, 1901, 1919, 1937, etc. This series will attain its maximum in the eclipses of the years 1935 and 1953, and the duration of total phase probably will be the longest that will have been seen for more than a thousand years.

The principal total eclipses of the sun visible in the northern hemisphere from the year 1896 to 1923 inclusive are the following:

Aug. 9, 1896, the moon's shadow passed over the northern part of Norway, Sweden, and Siberia, across Japan into the Pacific Ocean.

Jan. 22, 1898, the shadow passed across Northern Africa and through India, near Bombay and Calcutta.

May 28, 1900, the shadow passed across the northern part of Mexico, through Texas, Louisiana, Mississippi, and North Carolina, passing nearly centrally over Raleigh in that State, and then across the Atlantic to Spain and Northern Africa.

Aug. 30, 1905, the shadow will pass over the northern part of British America in the Hudson's Bay region, across Labrador into the Atlantic Ocean, which it will cross, and thence across Northern Spain, Southern France, the Mediterranean, and Egypt.

Jan. 14, 1907, a total eclipse will be visible in Central Asia, from near the Caspian Sea to China.

Jan. 3, 1908, and Apr. 28, 1911, total eclipses will be visible in the Pacific Ocean.

Oct. 10, 1912, the moon's shadow will cross South America from Peru to Brazil.

Aug. 21, 1914, the shadow will pass across Norway and Sweden, through Russia and Persia, and continue its course nearly to India.

Feb. 3, 1916, the shadow will pass near the Isthmus of Panama into the Atlantic Ocean, and cross it nearly to England.

June 8, 1918, the shadow will cross the Northern Pacific Ocean, strike the coast of America near Vancouver's island, and pass in a southeasterly direction over the whole U. S., reaching to Florida, where it will enter the Atlantic and terminate.

Sept. 10, 1923, the shadow will enter upon the Pacific Ocean, and cross the southern part of California and Texas, where it will enter the Gulf of Mexico.

It will be understood from the foregoing that a total eclipse of the sun at any one place taken at random is an extremely rare phenomenon. A partial eclipse of the sun, however, is visible at any point on the earth's surface every few years. The total number of eclipses of the sun is greater than that of the moon, but an eclipse of the moon is visible over at least an entire hemisphere of the earth, whereas one of the sun can only be seen over a fraction of a hemisphere. Hence in any one place eclipses of the moon may be seen more frequently than those of the sun. Only two, or at most three, eclipses of the moon can occur in any one year, whereas there may be four, or even five, eclipses of the sun.

An eclipse of the moon is for an ordinary observer a remarkable phenomenon, although it is of little astronomical interest. The time of its occurrence, and all the circumstances connected with it, can be predicted with more exactness than they can be observed. The most remarkable circumstance connected with such an eclipse is that although the moon may be completely immersed in the shadow of the earth, it is visible, shining with a lurid copper-colored light. This is owing to the earth's atmosphere, which refracts the sun's light passing over it. An observer of the moon at such a time would see a total eclipse of the sun by the earth. But after the earth had completely passed over and hidden the sun, he would see it surrounded by a bright ring of reddish light caused by sunlight refracted through the atmosphere of the earth. The brilliancy of this light would very largely depend on the amount of cloudiness around that part of the atmosphere through which the sun's rays passed. Hence the brilliancy of the moon in total eclipses varies considerably. It is said to have totally disappeared on some occasions. The light by which it shines is red because the red light passes most freely through the

earth's atmosphere. The cause is the same as that which makes the sun look red at setting.

The only satellites whose eclipses can be frequently observed are those of Jupiter. These are objects of considerable interest to the amateur astronomer, who can always observe them by means of the ephemeris, which gives the predicted times of the eclipses. As a satellite enters the shadow of the planet it fades gradually away, and finally disappears even when viewed in the most powerful telescope so far as is yet known. As the phenomenon is the same at all parts of the earth, such eclipses were once used to determine longitudes. But it is found that the fading away is so gradual that the exact time of disappearance can never be observed with any certainty, so that the longitudes determined from such observations may be 30 or 40 miles in error, or even more. As a practical method of determining longitudes, it has therefore been entirely abandoned.

Eclipses of Saturn's outer satellites, Titan and Japetus, may occur on very rare occasions, but observations are dependent upon such a combination of favorable circumstances that astronomers rarely if ever succeed in making them.

Information respecting the occurrence of eclipses can be most readily gained by consulting the volumes of an astronomical ephemeris. Here may be found maps showing the regions of the earth over which every total eclipse sweeps. These volumes, however, only extend two or three years in advance of the date of publication. For future eclipses, the most valuable source of information is Oppolzer, *Canon der Finsternisse*, published by the Academy of Sciences of Vienna, in 1887, as one of its volumes of memoirs. Here will be found diagrams of all the annular and total eclipses of the sun visible in the equatorial regions, or northern hemisphere of the earth, from B. C. 1200 to A. D. 2161. The only drawbacks to the use of this wonderful work are that the tables are somewhat uncertain in the case of the ancient eclipses, while the method of delineation is such that the shadow paths of modern eclipses may sometimes be several hundred miles in error. It can not therefore be relied upon to determine the exact points where total eclipses will be visible, though the region will be well enough indicated.

For the twentieth century, fairly accurate computations have been made by Mahler, of Vienna, and published in *Memoirs of the Vienna Academy of Sciences*, vol. xlix. Here will be found an exact computation of the shadow path over the earth's surface for all annular and total eclipses from the years 1900 to 1999 inclusive. S. NEWCOMB.

Ecliptic [Gr. *ὁ ἐκλειπτικός* (sc. *κύκλος*, circle), the circle in whose plane eclipses occur; liter., pertaining to an eclipse (*ἔκλειψις*)]: in astronomy, the great circle of the heavens which the sun appears to describe in its annual revolution. It is the circle to which longitudes and latitudes in the heavens are referred. From time immemorial the ecliptic has been divided into twelve equal parts, called signs of the zodiac—Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpio, Sagittarius, Capricornus, Aquarius, and Pisces. These signs, however, do not coincide with the constellations of the same names, but are merely arcs of thirty degrees reckoned from the intersection of the ecliptic and equator, which is not a fixed point, so that they are carried backward by the precession of the equinoxes. The sign Aries is now in the constellation Pisces. The plane of the ecliptic is that passing through the center of the sun and the earth's orbit around the sun. The angle which this plane makes with the plane of the equator is called the obliquity of the ecliptic, which is a variable quantity—about 23° 27′ 30″. The change of seasons is the result of this angle. Revised by S. NEWCOMB.

Eclogue, ek'log [via Lat. *ec'loga*, from Gr. *ἐκλογή*, selection, deriv. of *ἐκλέγειν*, select]: originally the select pieces of an author. The word usually signifies a pastoral poem, the main and proper subjects of which are the loves of shepherds or their adventures. These shepherds, however, are mostly imaginary personages, whose sentiments and circumstances belong rather to an ideal golden age than to the realities of common life. The *Eclogues* of Vergil, often called *bucolics*, have not all the true pastoral character, some of them being occasional poems on events of the day, only slightly enveloped in the pastoral costume. Spenser and Philips are among the eminent English pastoral poets.

École Polytechnique: See SCHOOLS.

Economic Geology: that branch of science which relates to the distribution, modes of occurrence, and exploitation of minerals employed by man. The applications of geology are—1, to agriculture, in the knowledge it conveys of the composition, structure, and origin of soils, the distribution and properties of mineral fertilizers, etc.; 2, to architecture, in materials for construction; 3, to engineering, in drainage, excavations, and construction; 4, to manufactures, in its revelations of the distribution, properties, and uses of ores, fuels, clays, oils, asphalts, gems, and other minerals employed in the arts. It also includes the theory and practice of mining. The relation of general geology to economic geology well illustrates the relation of all science to the industrial arts. Scientific research is conducted for the purpose of increasing our knowledge of nature, and especially for discovering the causal relations by which natural phenomena are connected. It is found that some of the knowledge of relations thus discovered may be applied to industrial ends, and the arts of civilization are the results of such applications. Economic geology is the industrial application of geologic generalizations and principles, the result of researches having for their primary motive only the enlargement of knowledge. See MINING and ORE DEPOSITS. Revised by G. K. GILBERT.

Economy [from Gr. *οἰκονομία*, management of a household, thrift; *οἶκος*, home + *νέμειν*, manage]: the regulation and government of a household or family; a frugal and prudent use of money or commodities; prudent management of affairs; sometimes the regular operations of nature in the reproduction, nutrition, and preservation of animals and plants. Rural economy is nearly synonymous with agriculture and the pursuits of farmers.

ECONOMY, POLITICAL: See POLITICAL ECONOMY.

Economy: borough; Beaver co., Pa. (for location of county, see map of Pennsylvania, ref. 4–A); situated on railway and on the Ohio river, 18 miles N. W. of Pittsburg. It was settled by German socialists called the Harmony Society (see RAPP, GEORGE, and HARMONISTS). Pop. (1890) 413; not returned separately in 1900.

Écorché, *ā'kōr'shā'* [Fr., past ptc. of *écorcher*, flay, skin; Ital. *scorticare* < Lat. **excortica're*, deriv. of *cortex*, bark]: a figure used as a model by artists, representing a man or animal without the skin, so that the muscular system may be more easily studied. The écorché is sometimes represented in action. It is generally made of papier-mache or of plaster of Paris.

Écoutes, *ā'koot'* [Fr., deriv. of *écouter*, listen: Ital. *ascolta're* < Lat. *ausculta're*]: in military engineering, small galleries excavated for the shelter of troops in front of the glacis and toward the enemy's works, whose mining operations may by this means be estimated and provided against.

Écraseur, *ā'kraă'zėr'* [Fr., deriv. of *écraser*, crust]: a surgical instrument for performing amputation, invented by Chassaignac, of Paris. The cutting is done by a small but very strong steel chain, a loop of which is passed around the tumor or other part to be removed. The two ends of the chain run through a steel tube, and in operation are drawn through the tube by an endless screw with a lever handle, which puts the ends of the chain into tension, diminishing the size of the loop and very slowly but irresistibly tearing away the inclosed substance. Its advantages are that the hæmorrhage following its judicious use is usually slight, and that healing takes place rapidly, with comparatively little suppuration. The shock is also comparatively slight, but it can never be used where nice dissection and skillful operation are required; and it is also somewhat unmanageable in its effects. Its use is becoming limited to a small and peculiar class of operations, chiefly upon mucous surfaces; in these its value is great.

Ecstasy [Gr. *ἔκστασις*, bewilderment, insanity, in Late Gr. trance, deriv. of *ἐξιστάναι*, set out of a place or state; *ἐκ*, out of + *ἱστάναι*, set, place]: a morbid mental state which, without amounting to insanity, on account of the temporary character of the affection, diminishes or alters consciousness and destroys the power of self-control. The history of religion furnishes numerous examples of this kind of mental aberration—the dancing epidemics in Germany and Italy in the Middle Ages, the Jansenist convulsionists in Paris in the earlier part of the eighteenth century, etc.

Ectozo'ön (plu. **Ectozo'a**) [from Gr. *ἐκτός*, outside + *ζῷον*, animal]: in contradistinction to ENTOZOA (*q. v.*), parasitic animals which live on the outside of other animals, such as lice and ticks, and the crustaceans found upon fishes and whales. A more common name for these creatures is EPIZOA (*q. v.*).

Ecuador (Sp. *República del Ecuador*, Republic of the Equator, in allusion to its position): a country of Western South America; bounded N. and N. E. by Colombia, S. E. and S. by Peru, and W. by the Pacific; area variously estimated at 120,000 to 276,000 sq. miles. The latter extension was claimed until recently in Ecuadorian official publications; it included an extensive region in the Amazonian basin, the possession of which is disputed by Peru, Colombia, and even Brazil. If the claims of these countries are allowed, Ecuador will be almost restricted to the Andean region and the Pacific coast; and even in these the Mira valley is disputed with Colombia and the Achira valley with Peru.

Topography, etc.—The Andes traverse Ecuador nearly from N. to S., in two great parallel chains which inclose an elevated region or plateau. The eastern chain, facing the Amazonian lowlands, is, as a whole, the highest, and forms an almost continuous wall, pierced only by the narrow river valleys of the Pastaza and Paute; locally this range is called the Andes proper. The western chain, known as the Cordillera, is, on the contrary, irregular and much broken; it contains, however, the highest peak in Ecuador, that of Chimborazo (20,496 feet). The plateau between the two ranges has an average width of perhaps 60 miles and an elevation of 7,500 to 10,000 feet; it is divided by cross ranges or knots into several minor basins or valleys, which, counting from south to north, are distinguished as the basins of Cuenca, Ambato, Quito, and Ibarra. North of the Cuenca basin the western Cordillera disappears almost entirely, and the eastern range is lower than at any other point between Southern Chili and Northern Colombia; there is thus a kind of pass in the Andean chain which must ultimately be of great importance. Around the basins of Ambato and Quito are gathered many of the highest peaks in South America, including about twenty active or extinct volcanoes. "Nowhere on the face of the earth," says Orton, "is there such a grand assemblage of mountains. Twenty-two summits are covered with perpetual snow, and fifty are over 10,000 feet high." Cotopaxi, in the eastern range, is the highest active volcano in the world (19,614 feet), and Cayambe and Antisana are hardly lower.

West of the mountain region the valleys end in low plains which skirt the Pacific coast. North of the Gulf of Guayaquil these are, in parts, 80 miles wide, but they are much broken by spurs of the Cordillera and lower isolated chains. East of the Andes there is an irregular fringing plateau, which abruptly ends in the plains of the Napo and other affluents of the Amazon.

Rivers.—Nearly all the streams of the plateau pass through the western range, and some of them unite to form navigable rivers on the coast plains; the most important of these is the Guayaquil or Guayas, which flows into the Gulf of Guayaquil, and the Esmeraldas, in Northwestern Ecuador. To the east of the mountains the Pastaza and Napo, with their numberless affluents, descend to the great Amazonian plains; the latter is the main and almost the only known route between the inhabited parts of Ecuador and the Amazon, and it can be navigated to a point within a hundred miles of Quito.

Lakes are numerous, and some of them are situated at great elevations. Cuy-cocha, on the side of the peak called Cotocachi, is 10,200 feet above the sea.

Harbors.—The Gulf of Guayaquil is the largest and safest harbor on the Pacific coast of South America, but will not admit very large vessels. The only other sheltered harbors are formed by river mouths, and are of little importance.

Islands.—Puna island, at the entrance of the Gulf of Guayaquil, is nearly 30 miles long, but it is low, marshy, and unhealthy. Numerous other small islands are scattered in the gulf and along the coast. The outlying GALAPAGOS ARCHIPELAGO (*q. v.*) is claimed by Ecuador.

Geology, Volcanoes, and Earthquakes.—Nearly all the higher peaks are of igneous origin, and the plateau is covered in great part with tufa and volcanic conglomerates. Granite, gneiss, and metamorphic schists occupy extensive areas on the eastern slopes of the Andes; the western Cordillera is largely porphyritic. Cretaceous formations skirt the highlands in many places, and the coast plains are of Tertiary or Quaternary age, with large tracts of modern alluvium along the rivers. The highlands of Ecuador are the great center of volcanic activity in South America. Violent eruptions from some of the numerous craters are of almost yearly occurrence, and earthquakes are frequent and sometimes very destructive. The great shock of Aug. 16, 1868, was felt from Colombia to Chili, but was most destructive in Ecuador, where, according to official estimates, 50,000 people perished; many towns were reduced to a mass of ruins. In 1797 the city of Riobamba was partly overwhelmed by earth and rocks loosened from a neighboring mountain by an earthquake.

Climate.—The coast region is hot, damp, and in many places very unhealthful. Yellow fever may be regarded as endemic at Guayaquil, and intermittent fevers are common and very severe. The plateaus have a temperate and pleasant climate, varying little through the year, and generally very healthful. Rains are less abundant than on the coast, but there are almost daily showers. The driest months are July and December. The eastern flanks of the Andes and the adjacent plains are constantly soaked with heavy rains, and the climate is perhaps the most humid in the world.

Vegetation.—Owing to the abundant rains and warm climate, the plains of the coast and the Amazonian basin are covered in great part with matted forests, which extend in many places far up the mountain sides and valleys. These forests are rich in cabinet woods, drugs, dyes, etc., but almost the only products collected are rubber (occurring both on the coast plains and along the Amazonian tributaries), ivory nuts, and small quantities of vanilla, sarsaparilla, cinchona, and tonka beans. There are extensive areas of grass land on the fringing plateau E. of the Andes, and others near the coast. The elevated interior basins are almost devoid of forest growth, and portions of them, owing rather to the soil than to any lack of moisture, are sterile. The fertile parts afford excellent pasturage.

Animals.—Ecuador has the usual rich fauna of the neotropical region (see AMERICA, SOUTH), the valleys of the eastern and western slopes being especially noted for their numerous and beautiful species of birds and insects. The coast forests have their own assemblage, different in great part from those of the Amazonian plains, and many species are confined to single mountains or valleys. Here the humming-birds have their chief habitat. The largest animals are tapirs and jaguars. Llamas are found principally in Southern Ecuador; farther N. mules take their place as beasts of burden. Condors are conspicuous about the mountains, but do not descend to the plains.

Minerals.—Gold and silver are almost the only metals extracted, and these not on an extensive scale. Quicksilver, copper, zinc, and iron are reported, and there are salines of considerable value. Large sulphur deposits occur in various volcanoes. Emeralds, long supposed to exist in Ecuador, have never been found there within historical times.

Inhabitants.—The population is officially estimated (1892) at 1,270,000, of whom about 100,000 are classed as whites, 300,000 as mixed, 670,000 as civilized Indians, and 200,000 as wild Indians; probably the latter are much overestimated. The African element is small. By far the greater portion of the people are gathered on the plateau, in the western valleys, and at a few points along the coast. The region E. of the Andes has very few civilized inhabitants, and is imperfectly known. Quito, the capital, on the plateau, has about 35,000 inhabitants; Guayaquil, the principal port, has 45,000; Cuenca, 25,000; and Riobamba and Latacunga 12,000 each.

The land is nearly all divided among a few rich proprietors, who hold the mass of the population essentially in a condition of serfdom. Agriculture and cattle-raising are almost the only industries, and these are carried on, with a few exceptions, in the most primitive fashion. Except on a few large sugar plantations, improved machinery and even plows are almost unknown. Coffee is cultivated to a considerable extent on the mountain sides; cacao is planted in the warm valleys and on the plains, affording one of the principal articles of export. The large sugar plantations are generally on the alluvial lands near the coast. Lucerne is cultivated largely on the plateau as food for cattle. In manufactures Ecuador is extremely backward. Aside from the sugar-mills, tanneries, and distilleries, and a few small cotton-factories, they are confined to cotton cloths and hats made in the country houses, and workshops of the simplest description. There is a single railway from Duran, on the river Guayaquil, to Chimbo, at the base of the Cordillera, 58 miles. This was acquired by an American company in 1897, who have rebuilt it to standard gauge and are continuing it 292 miles to Quito. The only wagon road is from Quito to Riobamba, 81 miles. There are about 1,250 miles of inland telegraph lines, and Guayaquil is connected by cable with Peru and Panama. The exports in 1897 were valued at 31,025,382 sucres, four-fifths of which was cocoa,

the remainder coffee, straw hats, hides, sugar, ivory nuts, etc. The imports were valued at 18,004,048 sucres, of which 1,631,406 sucres came from the U. S. The value of the sucre is about 45 cents.

Government, etc.—Ecuador is a centralized republic. The executive consists of president and vice-president chosen by universal suffrage for four years, and not eligible for immediate re-election. The election of vice-president alternates with that of president, so that he serves two years with one president, and two with the next. The president is assisted by four ministers (interior and foreign affairs, treasury, war and marine, and religion and public instruction). There is a council of state of five members chosen for six years. Congress consists of senate and assembly. The power of the president is much restricted. The Roman Catholic is the state religion and the only one tolerated. The Archbishop of Quito has practically more power than the president, and there are six bishoprics. Education is compulsory and free. There were, in 1900, 9 superior, 35 intermediate, and 1,088 primary schools, with 1,498 teachers and 68,380 pupils; besides seminaries and commercial and technical schools at Quito and Guayaquil. There are also university bodies in Cuenca and Guayaquil. The university at Quito was established in 1684. It serves principally for the education of priests; wealthy young Ecuadorians usually study in Europe.

Weights and Measures.—By a law of 1856 the French metrical system was made the legal standard, and it is now in general use.

History.—Vague Indian traditions, preserved in Velasco's *Historia de Quito*, go back to a powerful nation which held Quito and the neighboring territory in very ancient times; these were the Quitus, who, about the tenth century, were supplanted by the Caras, a tribe from the coast. Opinions differ as to the credibility of these accounts. It is certain, however, that in the fifteenth century the highlands of Quito were held by a race, presumably of Quichua stock, who, under their chiefs or *Scyris* made a long and brave resistance to the Inca armies from Peru. They were finally subdued by Huayna Capac, about 1590. That Inca left his kingdom divided between his two sons, Atahualpa, who reigned at Quito, and Huascar, who held Peru and the southern provinces. A war between the brothers ended in the overthrow of Huascar, just before the arrival of the Spaniards under Pizarro. Atahualpa, on his way to be crowned at Cuzco, met Pizarro at Cajamarca, Peru, was seized, and eventually killed (Aug., 1533). In 1534 Benalcazar, one of Pizarro's lieutenants, marched against Quito in alliance with the Cañaris Indians; Rumi-ñaui, who had been Atahualpa's general, resisted him, but was disastrously defeated on the plains of Riobamba, and the Spaniards took possession of Quito. The present territory of Ecuador became a presidency (often called the kingdom of Quito), ruled by an audience, which was subordinate to the Viceroy of Peru at Lima. Abortive attempts to throw off the Spanish rule were made in 1809 and 1812; another revolt at Guayaquil, 1820, was powerfully supported by Bolivar, who had by this time secured the freedom of Colombia; and his lieutenant, Gen. Sucre, defeated the Spaniards at the battle of Pichincha, near Quito, May 24, 1822. Shortly after Quito was united to the republic of Colombia, of which Bolivar was president. In 1831 Quito separated from Colombia and took the name of República del Ecuador. The first president was Gen. Juan José Flores, and he ruled either as president or general until 1845. But the people of Ecuador were not capable of sustaining a strong republican government; political squabbles and revolutions followed in quick succession, and since the time of Flores hardly any president has been able to serve out his full term. There was a short war with Peru in 1859, and about the same time Moreno, the president of Ecuador, interfered in the affairs of Colombia, bringing on a struggle that only increased the miseries of the two countries. In 1895–96 a civil war resulted in the success of the Liberal party, Gen. Eloy Alfaro becoming president.

References.—Fleming, *Wanderungen in Ecuador* (1872); Herrera, *Apuntes para la historia de Quito* (1874); Gonzalez Suarez, *Historia ecclesiastica del Ecuador* (1881); Cevallos, *Resúmen de la historia del Ecuador* (5 vols., 1886); Simson, *Travels in the Wilds of Ecuador* (1887); Orton, *The Andes and the Amazons* (1876); Wolf, *Géografía y Geología del Ecuador*; Whymper, *Great Andes of the Equator* (1892); *Boletin de la Sociedad Geográfica de Lima* (first volume closed Mar., 1892). The cartography of Ecuador is quite imperfect.

Herbert H. Smith.

Ecumen'ical [or *œcumenical*, from Gr. *οἰκουμενικός*, pertaining to the *οἰκουμένη* (sc. *γῆ*, earth), the inhabited world, partic. of *οἰκεῖν*, inhabit]: universal; applied to councils of the Christian Church in which all parts of the world are represented. (See Council, Œcumenical.) The latest of the councils called ecumenical (the Roman Catholic Council of the Vatican, 1869–70) proclaimed the infallibility of the pope.

Ec'zema [Gr *ἔκζεμα*, deriv. of *ἐκζεῖν*, boil forth; *ἐκ*, out + *ζεῖν*, boil]: commonly called **Salt Rheum**; a vesicular disease of the skin, characterized by watery blisters smaller than those of herpes and larger than ordinary sudamina, such as are sometimes seen in the difficulty known as "prickly heat." Eczema is often accompanied by intense itching, and is frequently transformed into a pustular or scabbing disease. It is generally chronic. Its treatment is both local and general. The local treatment, when the epidermis is thickened, is by alkaline applications with or without tarry or astringent admixtures. The "benzoated ointment of oxide of zinc" is an excellent application. If the system has received a specific taint, the iodides, with mercury judiciously used, are indispensable, and produce the happiest results. Arsenic in small doses is an extremely useful tonic in many cases. Change of air and visits to thermal and other springs and baths, though not strictly curative, often appear to be wonderfully palliative.

Edam, *ā*-daam' (Lat. *Eda'mum*): a town of Holland; province of North Holland; has a port on the Zuyder Zee, 12 miles N. N. E. of Amsterdam (see map of Holland and Belgium, ref. 5–F). It derives its prosperity from shipbuilding and a trade in cheese. Pop. 5,880.

Edda: a term applied to two entirely different monuments of the Old Norse literature.

I. *The Prose Edda*, also called *The Younger Edda* and *Snorri's Edda*, is a work intended as a manual of mythology and poetry for the use of young skalds. To it alone is the name *Edda*—i. e. *ars poetica*—given with propriety. In its original form (preserved in a MS. at Upsala dating from the end of the thirteenth century) it was in the main the work of the Icelander Snorri Sturluson (1178–1241), the most eminent skald of the decadence. (See Snorri Sturluson and Icelandic Literature.) Snorri's *Edda*, in some respects a rough draft, was worked over about 1250, and this revision, which contains important changes and additions, became a sort of *textus receptus* of the book. According to Snorri's plan, the *Edda* falls into three principal divisions: (1) the *Gylfaginning* (The Deception of Gylfi), in which a great variety of mythological material is thrown into the form of a story about the visit of the fabulous King Gylfi to Ásgarðr (Asgard, the home of the gods); (2) *Skáldskaparmál*, a treatise on the artificial poetic diction of the skalds, with many elaborate explanations of the origin of particular figures; and (3) *Háttatal* (composed between 1221 and 1223), illustrating, in the form of a long poetical encomium, the varieties of skaldic rhythm and meter. The first two of these divisions show Snorri's mastery of Icelandic classical prose and his wide knowledge of Northern myth; the *Háttatal* displays his consummate skill in the technique of the marvelously complicated skaldic style and versification. As an authority on mythology Snorri is to be used with great caution. As was to be expected from his comparatively late date, he often failed to understand the true meaning and connection of the myths of which he treats, and many details in his stories of the gods show the influence of Christian theology and legend.

The standard edition of the *Prose Edda* is the great Arna-Magnæan edition (Copenhagen, 1848–87), which furnishes a Latin translation and an elaborate *apparatus criticus*. There are handy editions by Rask (Stockholm, 1818), Egilsson (Reykjavík, 1848), and Thorleifr Jónsson (Copenhagen, 1875). E. Wilken's *Die prosaische Edda im Auszuge* (Paderborn, 1877–82), though scientifically far from irreproachable, has a convenient glossary. The English reader will find incomplete translations in the English version of Mallet's *Northern Antiquities* (London, 1770; Edinburgh, 1809), vol. ii.; in G. Webbe Dasent's *The Prose or Younger Edda* (Stockholm, 1842); and in R. B. Anderson's *The Prose Edda* (Chicago, 1880 [1879]).

II. *The Poetic or Elder Edda*, also called *Sæmund's Edda*, is a miscellaneous collection of Old Norse poems, mythological, heroic, satirical, and didactic, with some bits of prose, preserved in MS. 2365 of the Royal Library at Copenhagen (the *Codex Regius*). These vary much in style, but most of

them are in strong contrast to the labored artificiality of what is known as the skaldic poetry. Some of them are found elsewhere, and the terms *Edda* and *Eddaic* (or *Eddic*) are often extended to include other Old Norse poems (for example, the stanzas in the *Hervarar Saga*) which resemble some of those in this collection. The *Codex Regius* was discovered in Iceland in 1643 by Bishop Brynjólfr Sveinsson, who gave it the name *Edda Sæmundi Multiscii*, supposing it to be a long-lost work of Sæmund the Wise (1056–1133). This was a double misnomer; for, in the first place, the collection has nothing to do with Sæmund, and, in the second place, the title *Edda* properly belongs to the work of Snorri (see I., above) and to that alone. This error of Brynjólfr's has proved stubborn of correction, and has given rise to many mistakes. The term *Edda* has been absurdly interpreted *Great-grandmother*, and has been thought to indicate that the poems are, so to speak, the tales told by hoar antiquity to her listening descendants. (Compare the curiously similar error with regard to the Welsh Mabinogion, *q. v.*) The character of the collection has also been often misunderstood. The *Elder Edda* is not a single work, in any proper sense, but the result of the attempt of some unknown Icelander to take down in writing such poems, orally current, as pleased his fancy or seemed to him worthy of preservation. It is not compiled in accordance with any plan, and is often confused in arrangement and corrupt in text. Some of the most interesting pieces in it are mere tattered remnants of what they must once have been. The age of the *Edda* has been greatly exaggerated. In anything like their present form the poems can not any of them be older than the tenth century, and the latest of them are perhaps not much older than the *Codex Regius* itself (end of the thirteenth century).

As literature the *Elder Edda* is of the highest value. In the *Völuspá* (The Sibyl's Soothsaying) we have the highest flight of the heathen Scandinavian religious imagination, assisted perhaps by half-understood reports of Christian doctrines. In the *Lokasenna* (The Flyting of Loki) the humor is at times fairly Aristophanic. In the Helgi poems, and in some of those which deal with the Volsungs and the Hniflungs (*Nibelungen*), there is wonderful tragic power.

The standard critical edition of the *Elder Edda* is still Bugge's (*Norræn Fornkvæði*, Christiania, 1867). Other editions of importance are those of Rask (1818), Munch (1847), Lüning (1859, with a valuable commentary), Möbius (1860), Svend Grundtvig (2d ed. 1874), Karl Hildebrand (1876; with an excellent glossary by H. Gering, 1887), Sijmonds (1888, a valuable critical edition of which only one part has appeared), Finnur Jónsson (1888–90). The Arna-Magnæan edition (3 vols., Copenhagen, 1787–1828), though antiquated, is still indispensable. Vigfússon's text (in vol. i. of Vigfússon and Powell's *Corpus Poeticum Boreale*, Oxford, 1883) is quite untrustworthy, but his introductions and notes contain much that is of importance; Powell's translation (in the same work) is practically useless for the general reader, since it, of course, follows Vigfússon's rearrangements. The favorite German translation is Simrock's. There are English versions by Cottle (Bristol, 1797) and Thorpe (London, 1866), and some of the poems have been translated by R. B. Anderson in his *Norse Mythology* (Chicago, 1875). G. L. Kittredge.

Eddy, Clarence: organist; b. in Greenfield, Mass., June 23, 1851; early gave evidence of marked musical ability, and by the time he was sixteen years old was regarded as a fine organist. He then began systematic study under Dudley Buck, and in 1871 went to Germany and took a course under Haupt. Before returning home he gave recitals in several European cities with marked success. Upon his return he settled in Chicago, where, in 1876, he became director of the Hershey School of Musical Art, and gave a series of 100 recitals, with no repetitions. In 1876 he gave officially two concerts daily for a week at the Philadelphia Exhibition, and in 1889 he was invited by the French Government as a representative of American art to give official recitals in the Trocadero. Author of *The Church and Concert Organist* and *The Organ in Church*. D. E. Hervey.

Eddy, Henry Turner, C. E., Ph. D., LL. D.: educator and mathematician; b. in Stoughton, Mass., June 9, 1844; graduated at Yale in 1867 with the degree of A. B. In 1868 he was instructor in surveying in the Sheffield Scientific School; 1869–74 assistant Professor of Mathematics and Civil Engineering in Cornell University; 1874–90 Professor of Mathematics, Astronomy, and Civil Engineering in University of Cincinnati; and, since 1891, president of Rose Polytechnic Institute, Terre Haute, Ind. In 1884 he was vice-president of the mathematical and astronomical section of the American Association for the Advancement of Science. He is the author of *Analytical Geometry* (1874); *New Constructions in Graphical Statics* (1877); *Researches in Graphic Statics* (1878); *Thermodynamics* (1879); and of many papers in technical journals, among which may be mentioned *Maximum Stresses under Concentrated Loads*, published in 1890.

Eddy, Thomas Mears, D. D.: clergyman; b. in Newtown, Hamilton co., O., Sept. 7, 1823; studied in the classical seminary of Greensboro, Ind.; joined the Indiana Methodist conference in 1842; was editor of the *Northwestern Christian Advocate* from 1856 to 1868; served as pastor in Baltimore three years; was appointed to the Metropolitan church, Washington, D. C., in 1872, and elected the same year corresponding secretary of the Methodist Missionary Society. He was eminent as a journalist, and was author of a *History of Illinois during the Civil War* (2 vols. 8vo, Chicago, 1865). D. in New York, Oct. 7, 1874.

Eddy-currents (in electricity): See Foucault Currents.

Eddystone Lighthouse: a lighthouse in the English Channel; 14 miles S. S. W. of Plymouth breakwater, and 9 miles from the coast of Cornwall; lat. 50° 10′ 54″ N., lon. 4° 15′ 53″ E. It stands on the Eddystone rocks, which are daily submerged by the tide, and it rises about 85 feet above the high-water mark in the form of a circular tower, which gradually decreases in diameter from the bottom to the top, with a curved outline resembling the trunk of a tree. It has a fixed light, visible at a distance of 13 miles. It was erected in 1757–59 by Mr. Smeaton. The material employed was Portland limestone. Steps were cut in the rock, to make the foundation as solid as possible. The stones of each course of masonry were ingeniously dovetailed, and each course was doweled to the one below it. The result was an edifice of surpassing strength. The fate of past ventures made the destruction of Smeaton's building seem probable. The first lighthouse had been destroyed by a storm (1703), and the second had been burned (1755). Smeaton's lighthouse was undermined by the waves and a new building, like the old in appearance but with improved appliances, was built upon another of the Eddystone rocks and formally opened in the spring of 1882. See the article Lighthouse.

Edelfelt, Albert Gustav Aristid: genre and portrait painter; b. at Helsingfors, Finland, July 21, 1854; pupil of Gérôme, Paris; second-class medal, Paris Salon, 1882; medal of Honor, Paris Exposition, 1889. His work is notable for excellent drawing. Studio in Paris. W. A. C.

Edelinck, ā′de-link, Gerard: engraver; b. in Antwerp, Belgium, in 1640. He worked for many years in Paris, and was patronized by the French court and Louis XIV. He engraved portraits of many eminent persons, the *Holy Family*, after Raphael, the *Virgin*, after Guido, and several works of Lebrun. His engravings are remarkable for their delicacy and softness, and render costume, armor, etc., with singular perfection. He is ranked among engravers of the first order of those who are not original or, as they are called, painter-engravers. D. in Paris, Apr. 2, 1707.

Edelweiss, ā′del-vīs: a white, woolly, perennial herb (*Leontopodium alpinum*) belonging to the family *Compositæ*, and closely related to the common American plants known popularly as "everlasting," or "ladies' tobacco." It is a native of the Alps, and is annually collected for sale by the Swiss peasants. It is freely cultivated in gardens in America and Europe. Charles E. Bessey.

Eden [Heb., delight]: in the book of Genesis, the region including the garden where at first dwelt Adam and Eve, the first parents of mankind, from which they were expelled in consequence of disobedience. Much discussion has prevailed among critics as to the country where this early paradise was situated. Ceylon, the vale of Kashmir, the lower, middle, and upper regions of the Euphrates, the Caucasus, Turkestan, and other regions have been named. At present the choice appears to lie between Armenia and Babylonia, with a preponderance of argument and authority in favor of the latter. The difficulty consists in identifying the four rivers mentioned in the biblical narrative.

Those who hold the theory that Eden was situated in Armenia take the starting-point from the known sources of the Tigris and the Euphrates and seek two other rivers

rising in the same region. Thus Pison is identified with Phasis, Havilah with Colchis, Gihon with Araxes, and Cush with Κοσσαῖοι. Among the representatives of this theory are Reland, Calmet, Leclerc, Keil, and others. The objections to it are that the Κοσσαῖοι can be found on neither the eastern nor the western shore of the Caspian Sea, and the four rivers can by no show of probability be supposed to be the branches of one parent stream. The hypothesis that the Hebrew word *nahar* does not mean a "stream," but "a river system," is not supported by the usage of the language, and the hypothesis of Luther and others that the Flood so altered the physical features of Asia that the present courses of the streams are different from the original ones is not supported by the biblical account of the Flood.

Those who hold the theory that Eden was situated in Babylonia fall into two groups. The first group, represented by Calvin, Scaliger, Huet, Bochart, and others, places Eden on the Satt-el-Arab, considering the Euphrates and the Tigris as the two branches of the river of Gen. ii. 10, reckoning up the stream, and identifying the Pison and the Gihon with the two main arms through which the Satt-el-Arab empties itself into the Persian Gulf. Classical history, however, the cuneiform inscriptions, the very nature of the soil, and the present rate of physical change in that region, make it certain that at one time the sea extended more than 100 miles farther to the N., thus covering the supposed site of Eden. The second group, represented by Delitzsch and others, places Eden in Northern Babylonia, immediately about the site of Babylon. At that point the Euphrates and the Tigris approached very near to each other, and the country was intersected by a great number of watercourses, whose current, on account of the difference of the level, was always from the Euphrates toward the Tigris. The effect thereby produced was that of an extremely wide river flowing in numberless channels. The objection to this theory is its vagueness, its incapacity for definite physical identification. See the article by Francis Brown in Schaff's *Religious Cyclopædia*.

Edenkoben, ā'den-kō-ben: a town of the Palatinate, Bavaria: on a railway, 7 miles N. of Landau (see map of German Empire, ref. 6–D). It has mineral springs and manufactures of wine and firearms. Pop. (1890) 4,914.

Edenta'ta [Lat. past partic. of *edenta're*, deprive of teeth; *e* (*ex*), forth + *dens*, tooth]: an order of placental mammals having no teeth in the front portion of the jaws, teeth, when present, all of the same general form, without enamel, and, with the exception of *Tatusia*, having no predecessors and growing continuously throughout life. The existing members of the order are the sloths, ant-eaters, armadillos, pangolins or scaly ant-eaters, and aard-varks or African ant-eaters. The extinct forms are the gigantic glyptodons and megatheria. The forms and habits of the various members of the order are extremely diverse. The sloths dwell in trees and feed solely on leaves, the ant-eaters are terrestrial and live on ants and termites, while the armadillos burrow in the ground and eat both animal and vegetable food. The distribution of the group is likewise peculiar. No edentates, living or extinct, are found in Europe, the pangolins are restricted to parts of Africa and tropical Asia, and the two species of aard-varks are confined to Africa. South America is the chief habitat of the group both in species and numbers, and but one species occurs so far north as Southern Texas, although fossils show that representatives of the order were once found in Ohio and Virginia. The name *Edentata*, given by Cuvier, is objected to by some as being, in a literal sense, incorrect, but the Linnæan name *Bruta* is equally inappropriate, since it was used by him for a heterogeneous group containing the elephant, sloths, ant-eaters, armadillos, and manatees. F. A. Lucas.

E'denton: town and port of entry; capital of Chowan co., N. C. (for location of county, see map of North Carolina, ref. 2–J); situated on railway and on Edenton Bay, which opens into Albemarle Sound; 150 miles E. by N. of Raleigh; has extensive fisheries. Pop. (1880) 1,382; (1890) 2,205; (1900) 3,046.

Edersheim, ā'ders-hīm, Alfred, Ph. D., D. D.: divine; b. of Jewish parents in Vienna, Mar. 7, 1825; educated in Vienna; became a Christian and a minister of the Free Church of Scotland 1849; passed over to the Church of England in 1875. He wrote many volumes on biblical topics, especially a superior *Life of Jesus, the Messiah* (2 vols., London, 1883; 3d ed. 1886). D. at Mentone, France, Mar. 16, 1889.

Edessa, ĕe-des'sa, or **Callirrhoe**, kăl-lir'ō-ĕe: an ancient city of Mesopotamia, supposed to be on or near the site of Ur of the Chaldees, mentioned in Genesis xi., though by others identified with Erech, one of the principal cities of the Babylonian empire. The extreme antiquity of its origin is undoubted, but nothing is known with certainty of its history until after the Macedonian conquest of Persia, when a Græco-Macedonian colony was settled there. It was 78 miles S. W. of Diarbekir. It became the capital of an independent kingdom in 137 B. C., and was tributary to Rome in the reign of Trajan. In 216 A. D. it became a Roman military colony. It was an important place in the early history of the Christian Church, and contained numerous monasteries, and was the residence of Ephraem the Syrian (*q. v.*). Christianity was early introduced in the city, though the legend about the correspondence between Christ and King Abgarus appears to have no sufficient historical foundation. In the third century the city became the seat of a Christian bishop. For many years it was the principal center of Oriental learning. Baldwin, a leader of the crusaders, and afterward King of Jerusalem, became Prince or Count of Edessa in 1097 A. D., and made it the capital of a Latin principality. Its capture by the Saracen chief Noor-ed-Deen, who massacred the inhabitants, was the cause of the second crusade (1147), but the Christians failed to regain possession. It was afterward possessed successively by the Byzantine emperors, the Mongols, Persians, and Turks. The site is occupied by the modern town of Orfa (*q. v.*).

Edessa: the ancient capital of Macedonia; situated about 46 miles N. W. of Salonica. It continued to be the burial-place of the Macedonian kings after the court was removed to Pella. Philip, father of Alexander the Great, was killed here. This site is occupied by the modern town of Vodena (*q. v.*).

Edfu, ed'foo, or **Edfou** (anc. *Apollinopolis Magna*; Coptic, *Atbo*): a small town of Upper Egypt, on the west bank of the river Nile, about 60 miles above Thebes. It has two temples, the larger one of which is on a grand scale, and being in excellent preservation gives a good idea of the Egyptian temples in their glory. It was built chiefly by Ptolemy Philometor (181–145 B. C.), the last King of Egypt who is noticed in sacred history. Its entire length (including court and temple) is 451 feet. On each side of the entrance is a pyramidal tower 108 ft. 2½ in. high, adorned with gigantic sculptures. Through this entrance the court is reached, 161 feet long, 140 feet wide, and inclosed by a splendid colonnade, each of whose pillars shows a design of its own. The impression of this magnificent architectural structure is spoiled, however, as the court is filled with rubbish and occupied by wretched dwellings. To the Egyptologist, however, the place is of extreme interest as furnishing the most perfect specimen of an ancient Egyptian temple, and the great fame which it enjoyed among the Greeks and Romans seems to be fully deserved. (See Egypt, Ancient.) Within the temple is the chamber, 33 feet by 17, which contained the image of the deity. The town has manufactures of blue cotton cloth and a kind of earthenware which finds ready sale in all Egypt on account of its striking resemblance to the pottery depicted on the monuments. The city is noted for the importunity and insolence of its beggars. Pop. 3,000.

Edgar: city; Clay co., Neb. (for location of county, see map of Nebraska, ref. 11–F); on two railways; 26 miles S. E. of Hastings; in a district devoted to agriculture and stock-raising. Pop. (1880) 577; (1890) 1,105; (1900) 1,040.

Edgar: King of the English from 959 to 975; called Edgar the Peaceful, from the character of his reign, which, through the wise administration of his minister Dunstan (*q. v.*), was marked by the restoration of law and order and by the promotion of learning. Edgar ruled over Wessex, Northumbria, and Mercia, and forced the Danes of Ireland to acknowledge his overlordship. Eight vassal kings are said to have rowed him in his boat on the Dee. The fusion of the Danes with his English subjects, the vigorous enforcement of the laws, and the improvement of trade made his reign an epoch of greater prosperity than England had hitherto known.

Edgar the Atheling: grandson of Edmund Ironside and heir to the English throne; b. in Hungary about 1057; was chosen king after the death of Harold in 1066, but the submission of the kingdom to William the Conqueror pre-

vented Edgar's succession, and all subsequent attempts to regain the throne proved unavailing. From Scotland, where he had taken refuge with King Malcolm, his brother-in-law, he encouraged the revolts of 1068 and 1071; joined Robert, Duke of Normandy, against William Rufus (1091) and against Henry I., but was taken prisoner by the latter at Tenchebrai (1106). Little is known of the last years of his life, and the date of his death is uncertain.

Edgar, Henry Cornelius: clergyman; b. in Rahway, N. J., Apr. 11, 1811; graduated at Princeton in 1831, read law, but was forced by illness to relinquish study, and traveled extensively. After some years in mercantile life and teaching, he became a Presbyterian minister in 1845, was pastor in Bridgehampton, L. I., and afterward in Easton, Pa. He delivered many lectures on education and temperance, contributed to religious and secular magazines, and published orations and sermons, including *Christianity our Nation's Wisest Policy* (1872) and *The Relation of the Pulpit to Politics* (1884). D. in Easton, Pa., Dec. 23, 1884.

Edgar, James David: member of Canadian Parliament; b. in Eastern Townships, Province of Quebec, Aug. 10, 1841, and educated at Quebec. He was admitted to the bar in 1864, and sent to British Columbia in 1874 by the Canadian Government to arrange terms for the postponement of the construction of the Canadian Pacific Railway. He was for a time legal editor of the Toronto *Globe* and of the Montreal *Trade Review*, and a general writer for the press. He entered Parliament in 1872 and sat for two years; elected again in 1884, 1887, 1891, and 1896, and in the last-named year was made Speaker of the House of Commons. He became a Queen's counsel in 1890, and in 1897 a member of the Queen's Privy Council. He has been a frequent contributor to periodicals, and is author of *The Insolvent Act of 1864* (Toronto, 1865): *The White Stone Canoe* (1887); and *This Canada of Ours, and other Poems* (1893).

Edgartown: port of entry; capital of Dukes co., Mass. (for location of county, see map of Massachusetts, ref. 6–J); situated on the east shore of the island of Martha's Vineyard, 30 miles from New Bedford, on the mainland. Here is a small but safe harbor, and a pier on which is a fixed light 37 feet high, in lat. 41° 23′ 25″ N., lon. 70° 29′ 5″ W. Edgartown is on the Martha's Vineyard Railway, and has communication by steamboat with the mainland. It is a summer resort and a headquarters for whale-fishing. Pop. of township (1880) 1,303; (1890) 1,156; (1900) 1,209.

Edgefield, or **Edgefield Court-house**: town (founded in 1785); capital of Edgefield co., S. C. (for location of county, see map of South Carolina, ref. 6–C); situated on railway, 24 miles N. of Augusta, Ga. It has 6 churches, 2 schools, cottonseed-oil mill, brick-yards, fertilizer-factory, and tannery. Pop. (1880) 808; (1890) 1,168; (1900) 1,775.

Editor of "Advertiser."

Edgehill: a ridge in Warwickshire, England; 7 miles N. W. of Banbury (see map of England, ref. 11–H). It was the scene of the first great battle of the civil war, which occurred Oct. 23, 1642. The royalist army was commanded by Charles I., and that of the Parliament by the Earl of Essex. Prince Rupert, by a charge of cavalry, broke the left wing of the parliamentarians, whom he pursued to Kineton, while the right wing of Essex's army defeated the royalists. Thus the battle proved disastrous to both armies, and the loss was so nearly equal that neither party could claim the victory. Clarendon estimated the total number of killed at 5,000. Among the slain was the Earl of Lindsay, who had led the king's infantry.

Edg'erton: city (founded in 1858); Rock co., Wis. (for location of county, see map of Wisconsin, ref. 7–E); situated on Ch., M. and St. P. Railroad, 25 miles S. E. of Madison. It has 7 churches, a large high school, a pottery, and 34 tobacco-packing houses, and is one of the most important tobacco centers in the State. Pop. (1880) 869; (1890) 1,595; (1900) 2,192.

Editor of "Index."

Edgerton, Alonzo Jay: jurist; b. near Rome, N. Y., June 7, 1827; graduated at Wesleyan University in 1850. He settled in Minnesota, and soon became prominent politically, serving as a member of the Legislature 1858–59. In Aug., 1862, he was commissioned as captain of an infantry company which he had recruited, and served in the Indian campaigns of 1862–63. He was made colonel of the 67th U. S. Infantry (colored) in Feb., 1864, and served with that command in Louisiana. His regiment and the 65th were consolidated under the latter number in 1865, and later he was breveted brigadier-general and placed in command of the district of Baton Rouge, where he remained until he was mustered out in the winter of 1867. He was a presidential elector in 1876, and again a member of the Minnesota Legislature 1877–78. In 1881 he succeeded Mr. Windom as U. S. Senator, and in December of that year was appointed chief justice of the Territory of Dakota. He was president of the convention which, in 1885, formulated the Constitution of the State of South Dakota, also of the convention that revised that Constitution in 1889 in accordance with requirements made by Congress. On the admission of the State into the Union he became district judge for South Dakota, and held that office until his death, in Sioux Falls, Aug. 9, 1896.

Edgewater: village: Richmond co., N. Y. (for location of county, see map of New York, ref. 8–A); now a part of the Borough of Richmond, New York city; situated on the northeast shore of Staten Island; 6 miles S. S. W. from New York city, with which it is connected by ferry. It is on the Staten Island Railroad, has numerous churches, educational institutions, a savings bank, and manufactories, and the residences of many New York business men. Pop. (1880) 8,044; (1890) 14,265.

Edgeworth, Henry Essex: Roman Catholic priest; known as l'Abbé Edgeworth de Firmont; b. in Edgeworthstown, Ireland, 1745; the son of a Protestant clergyman who turned Catholic; was educated at Toulouse and at the Sorbonne, Paris, and after taking orders became confessor to Madame Elizabeth. He was afterward appointed confessor to her brother, Louis XVI., whom he had the courage to attend on the day of his execution, accompanying him to the foot of the scaffold and sustaining him with spiritual consolation. An object of hatred to the mob, he escaped from France amid the greatest peril, and, in 1796, returned to England, where he was received with honor. He afterward became the chaplain of Louis XVIII. at Mittau, Russia, where he died May 22, 1807, from a disease contracted by attending the French prisoners of war at that place. His *Memoirs* were edited in English by C. S. Edgeworth (London, 1815), and in French by Dupont (Paris, 1815). His *Letters* were published in Paris, 1818.

F. M. Colby.

Edgeworth, Maria: author: b. near Reading, England, Jan. 1, 1767; removed with her father, Richard Lovell Edgeworth (*q. v.*), to Edgeworthstown, in Ireland, in 1782. In 1801 she produced *Castle Rackrent*, the first of a series of novels, among the best of which are *Belinda* (1803); *Leonora* (1806); *The Absentee* (1812); *Patronage* (1814); *Ormond* (1817); and *Helen* (1834). She also published *Popular Tales* (1804) and *Tales of Fashionable Life* (1809–12), and wrote a number of works in conjunction with her father, among them her first literary work, *Essays on Practical Education* (1798), *Essay on Irish Bulls* (1802), *The Parent's Assistant*, and *Harry and Lucy*. Her stories for children were as popular in the U. S. as in England. D. in Edgeworthstown, May 21, 1849. See Miss Thackeray, *The Book of Sibyls* (1883), and the *Life* by Helen Zimmern (1883).

Edgeworth, Richard Lovell, F. R. S.: inventor and author; b. in Bath, England, May 31, 1744. He belonged to a family that had long been settled in Ireland, and inherited his father's estate in Edgeworthstown, County Longford. He was educated at Trinity College, Dublin, and at Corpus Christi, Oxford; married in 1763 and settled near Reading, England. His mechanical contrivances brought him considerable fame, and in 1771 he went to France to superintend part of the works undertaken to alter the course of the Rhône. In 1782 he removed to Edgeworthstown, where he devoted himself to questions of education and political economy. He was active in public affairs and sat in the last Irish Parliament (1798–99). Among his inventions was a system of communication by telegraphy. He published several works, mostly in partnership with his daughter Maria, the novelist, among them *Practical Education* (2 vols., 1798) and *On the Art of Conveying Swift and Secret Intelligence*. He was married four times. D. in Edgeworthstown, June 13, 1817. See *Memoirs* (partly autobiographical) *of Richard Lovell Edgeworth* (1820; 3d ed. 1844), by his daughter.

Edgreen, Anna Charlotta: author; b. in Sweden, Oct. 1, 1849; the daughter of J. O. Leffler, a school superintend-

ent in Stockholm. She wrote a number of very popular realistic novels, *Pictures of Life*, *True Women*, etc. In 1872 she married Mr. Edgreen, from whom she was divorced, and in 1890 she married an Italian duke, by name Caianello. Among her later productions is the drama *Hur Man gör godt* (How to Do Good). D. in Naples, Oct. 24, 1892.

R. B. A.

Edgren, August Hjalmar: author and educator; b. in Wermland, Sweden, Oct. 18, 1840; graduated at the University of Upsala and at the Royal Military School of Sweden in 1860; went to the U. S. and served as lieutenant in the civil war, in 1862 and 1863, and served in the regular army of Sweden 1864–70, when he again went to the U. S. He taught modern languages in Riverview Academy 1871–72, was instructor in French, German, and Sanskrit in Yale 1874–80, and lecturer on Sanskrit in the University of Lund, Sweden, 1880–84, and then became Professor of Modern Languages and Sanskrit in Nebraska University. He has written numerous papers on Sanskrit, Romance, and Germanic philology, which have been published in Sweden, England, and the U. S. Among his publications are a Swedish translation of Longfellow's *Evangeline* (1875); a *German and English Dictionary*, with W. D. Whitney (1877); a work in Swedish on *The Literature of America* (1878) and one on *The Public Schools and Colleges of the United States* (1879); *Swedish Literature in America* (1883); and *American Antiquities* (1885).

Edhem Pasha: Turkish statesman; a native of Scio and of Greek family; b. in 1823; purchased as a slave in his boyhood; sent by his master to the École des Mines, Paris; returned to Constantinople 1839; placed on the general staff, and rose to the rank of colonel; aide-de-camp to Abd-ul-Medjid and captain-general of the imperial guard 1849. In 1867 he was Minister of Foreign Affairs, and for the next eight years ambassador at different European courts. In Dec., 1876, he represented Turkey in part at the general conference of the powers. In Feb., 1877, he succeeded Midhat Pasha as grand vizier. He served in 1879 as ambassador at Vienna, and from 1883 to 1885 as Minister of the Interior. On the outbreak of the war between Turkey and Greece in 1897, he was placed in command of the army of precaution concentrated in Monastir, and made arrangements to move 75,000 men over the frontier within a few weeks, including 21 batteries of artillery and 10 squadrons of cavalry. During the fighting that soon followed Edhem Pasha utilized the topographical advantages of his position to the utmost, and his vigorous offensive campaign soon forced the Greek army to withdraw from Thessaly.

Edict [from Lat. *edic'tum*, proclamation; *e*, forth + *di'cere*, speak]: a public decree or proclamation issued by a sovereign or other potentate; an instrument signed and sealed as a law. In ancient Rome the power of making edicts was principally exercised by the *prætor urbanus* and the *prætor peregrinus*, who on entering office published rules for regulating the practice of their courts, etc. The edicts of a prætor were not binding on his successor, but if confirmed by the latter they were called *edicta vetera* (old edicts), as distinguished from the *edicta nova* (new edicts) framed by himself. A digest of the best decisions of the prætors was made under the Emperor Hadrian by Salvius Julianus. It was called *Edictum Perpetuum*, and made the invariable standard of civil jurisprudence.

Edict of Nantes: one of the most famous edicts of history; issued by Henry IV. of France, Apr. 13, 1598, to secure to the Protestants a legal existence within the French monarchy. They obtained permission to celebrate service wherever they already had formed communities, and to establish new churches wherever they chose, with the exception of Paris and the royal residences. They were also permitted to found universities or theological seminaries, and the schools of Montpelier, Montauban, Saumur, and Sedan soon became prominent centers of learning. Nor should their faith be any impediment to their promotion to any civil or military office, etc. The restrictions imposed upon them were few and lenient. Though the act was solemnly confirmed by Mary of Medici, regent after the assassination of Henry IV., by Louis XIII., and even by Louis XIV., it was never fully carried out. The Huguenots were always more or less exposed to vexations, especially after the fall of La Rochelle in 1628, when they lost nearly all political importance. Nevertheless, it was not until the latter part of the seventeenth century, under the reign of Louis XIV., that the vexations assumed the charater of open persecution. The Edict of Nantes was revoked by Louis XIV. Oct. 17, 1685, and its revocation led to a renewal of the bloody scenes which before the issuing of this edict had been enacted among the Huguenots. The depopulation caused by the sword was also increased by emigration. The Huguenots were very generally skilled artisans, and about half a million of her most useful and industrious subjects deserted France, and exported, together with immense sums of money, those arts and manufactures which had largely tended to enrich the kingdom. About 50,000 refugees passed over into England, and many more into Germany and America. The Huguenot refugees became very important elements in the industrial development of Germany, Holland, England, and the U. S.

Revised by C. K. Adams.

Edi'na: town (founded in 1839): capital of Knox co., Mo. (for location of county, see map of Missouri, ref. 1–H): situated on railway, 47 miles N. W. of Quincy, Ill. It has 6 churches, a fine public school, a convent school, 2 carriage and wagon factories, a flouring-mill, a creamery, water-works, and electric lights. Pop. (1880) 1,156; (1890) 1,456; (1900) 1,605.

Editor of "Knox County Democrat."

Edinboro: borough; Erie co., Pa. (for location of county, see map of Pennsylvania, ref. 1–A): 18 miles S. of Erie. It is the seat of the Northwestern State Normal School, and has manufactures of lumber, pumps, sash and blinds. Pop. (1880) 876; (1890) 1,107; (1900) 691.

Edinburg: town; on railway; Johnson co., Ind. (for location of county, see map of Indiana, ref. 7–E); situated on the Blue river, 30 miles S. S. E. of Indianapolis. It has 5 churches, a high school, 2 public schools, good water-power, a cereal-mill, flouring-mills, starch-works, ice-plant, foundry and machine shops, cabinet-factory, carriage and wagon factory, and water-works. Pop. (1880) 1,814; (1890) 2,031; (1900) 1,820.

Editor of "Courier."

Edinburgh, ed'in-bŭr-rŭ [said to be a corruption of Edwin's burgh, the castle having been built by Edwin, King of Northumbria (616–633)]: capital of Scotland and of Edinburghshire or Midlothian; picturesquely situated about a mile S. of the Firth of Forth; 399 miles N. N. W. of London; lat. 55° 57′ N., lon. 3° 12′ W. (see map of Scotland, ref. 11–H). It is divided into the Old and New Town, the former of which occupies the middle and highest of three ridges extending east and west. The Old Town is separated by a narrow hollow or ravine from the New Town, which was built on a broader ridge with more gently sloping sides. Edinburgh is remarkable for the elegance and solidity of its buildings, which are all of stone. The adjacent country is pleasantly diversified with hills and plains. On the southeastern border of the city a hill called Arthur's Seat rises to the height of 822 feet.

The principal street of the Old Town is that which extends along the crest of the ridge, bearing in different parts the names of Canongate, High Street, Lawn Market, and Castle Hill. It is more than a mile long, and rises with a regular but rather steep acclivity from the palace of Holyrood, which is at its eastern end, to the huge rock on which stands Edinburgh Castle, 443 feet above the level of the sea. This street is lined with lofty and antique residences, many of which have seven or more stories. The houses of the New Town are built of a fine white freestone quarried in the vicinity, and are remarkably handsome. Here are three parallel avenues called Queen Street, George Street, and Princes Street, the last of which extends along the south side of the New Town, close to the hollow which separates it from the Old. Princes Street is the most agreeable promenade in the city, and, as it is lined with houses only along its northern side, it commands a fine view of the Old Town with its lordly castle and of the intervening valley adorned with public gardens. At the eastern end of this street is a rocky eminence called Calton Hill, the broad verdant summit of which commands a beautiful view of the Firth of Forth, here about 6 miles wide. Arthur's Hill and another high hill called Salisbury Crags afford prospects of almost unrivaled beauty and magnificence.

The most remarkable public edifices and monuments are the castle, which is a large fortress capable of accommodating 2,000 men, and is one of the oldest structures in the city; the royal palace of Holyrood, or Holyrood House, the oldest part of which was built about 1528: this palace is quadrangular in form, with a central court 94 feet square, and is famous as the residence of Mary Queen of Scots; the

cathedral of St. Giles, a large and ancient edifice of unknown date, in the later Gothic style; Victoria Hall, or Assembly Hall, a magnificent structure, which stands at the head of High Street, has a spire 241 feet high, and is the place where the General Assembly of the Church of Scotland annually meets; the Parliament House, now a hall connected with the courts of law; and the admirable monument erected to Sir Walter Scott, which stands on Princes Street, is 200 feet high, and is unequaled among the monuments of this metropolis for artistic beauty. Among the other objects of interest are the old Tron church, the Free St. George's church, the Free High church, the university buildings, the observatory, the National Gallery of Art, the Royal Institution, a beautiful Grecian edifice containing the apartments of the Royal Society, a chapel belonging to the ruined abbey of Holyrood, founded by David I. about 1128, the theater, and the National Monument (an uncompleted imitation of the Parthenon) on Calton Hill.

Edinburgh contains over one hundred churches and chapels belonging to various denominations—the Free Church, Church of Scotland, United Presbyterian, Presbyterian, Episcopal, Baptist, Congregational, Roman Catholic, Methodist, Evangelical, Unitarian, etc. It is the seat of a bishop of the Episcopal Church and of a Roman Catholic vicar-apostolic. It has numerous large and richly endowed hospitals and charitable institutions, among which is Heriot's Hospital, founded for the education and maintenance of poor boys. This city is important as a center of learning, and is distinguished for the number and excellence of its literary, scientific, and educational institutions. The aristocracy, the literati, and professional men form an unusually large proportion of its population, which is extensively engaged in the business of printing and publishing books. Edinburgh is the headquarters of the book-trade in Scotland, and as a literary mart is second only to London among the British cities. Here is the celebrated UNIVERSITY OF EDINBURGH (*q. v.*). The other chief educational institutions are the High School, which occupies a handsome Doric edifice 270 feet long, the New College, or Theological Seminary of the Free Church, the Royal College of Surgeons, the medical school, the Royal Academy of Fine Arts, and the Royal Society. The Advocates' Library has the largest and most valuable collection of books in Scotland—300,000 volumes; that of the Writers to the Signet nearly 90,000 volumes. There is also a free public library.

Edinburgh is the seat of the supreme courts of Scotland, the principal of which is the court of session, composed of thirteen judges. This court tries all civil causes, and decides not only on the law of the case but also in questions of equity. This city returns four members to Parliament. By virtue of ancient charters and modern acts of Parliament it is a royal burgh, governed by a town council of fifty members elected by popular vote, and by a lord provost, who is elected by this town council. It is the terminus of the North British, the Edinburgh and Glasgow, and the Caledonian railways. This city has two ports on the Firth of Forth—Leith and Granton. Pop. (1891) 261,261; (1901) 316,479.

History.—Edinburgh was recognized as a burgh by David I. in 1128, and a Parliament was held here in 1215. David I., who before his ascension to the throne of Scotland had been Earl of Huntingdon, and was well acquainted with the military and ecclesiastical architecture of the Anglo-Norman kings, built the abbey of Holyrood, which often received the Scottish court as guests. Edinburgh became the capital of Scotland about 1436, when its castle was selected as the only place of safety for the royal household and the Parliament. It was inclosed by walls in the fifteenth century, and for a long period was confined to the central ridge. The hollow between this and the northern ridge was filled with water, called the North Loch. The New Town originated about 1765, when a bridge was erected across that loch to connect the Old Town with the New. Here occurred in May, 1843, the disruption of the Established Church, from the General Assembly of which 203 members seceded and organized the Free Church.

Edinburgh, ALFRED ERNEST ALBERT, Duke of: second son of Victoria, Queen of Great Britain; b. at Windsor Castle, Aug. 6, 1844. He was educated chiefly by private tutors. He entered the British navy in 1858, and served chiefly on foreign stations. In 1862 he was offered the crown of Greece, but declined it. In 1866 he took a seat in the House of Peers by his present title. In 1867 he set sail in command of the frigate Galatea, visiting Australia, Japan, China, India, etc. At a picnic at Clontarf, New South Wales, Mar. 12, 1868, he was slightly wounded by a pistol-shot fired by a Fenian named O'Farrell, who was soon afterward executed. On Jan. 23, 1874, he married the Grand Duchess Marie, only daughter of Alexander II. of Russia. In Nov., 1882, he was promoted to the rank of vice-admiral, and in 1886 was appointed admiral in command of the Mediterranean squadron. The full title of this prince is "his Royal Highness Prince Alfred Ernest Albert, Duke of Edinburgh, Earl of Kent, and Earl of Ulster, K. G., K. P." He is also a Duke of Saxony, and became reigning Duke of Saxe-Coburg-Gotha Aug. 22, 1893.

Edinburgh Review: a celebrated critical magazine founded at Edinburgh in 1802, the oldest of the great British quarterly reviews. Francis Jeffrey, Sydney Smith, Henry Brougham, and Francis Horner were the founders and first contributors of this review, which was a strenuous advocate of Whig principles. Sydney Smith edited the first number, of which 750 copies were printed. Mr. Constable was the original publisher. Lord Jeffrey became its editor in 1803, and conducted it with great ability and success for twenty-six years. The brilliant wit, the critical keenness, the eloquent style, and the extensive knowledge displayed by the contributors produced a great sensation in the literary world. Its circulation had risen to 9,000 in 1808, and 12,000 or more in 1813. Among the eminent men who contributed largely to it were Macaulay, Carlyle, Lord Brougham, Sir J. Mackintosh, and Henry Rogers. Macvey Napier succeeded Lord Jeffrey as editor in 1829. The price paid to contributors was at first ten guineas a sheet, but it was soon raised to sixteen guineas.

Edinburghshire, or **Midlothian**: a county in the southeast part of Scotland; area, 363 sq. miles. It is bounded N. by the Firth of Forth. The surface is diversified by plains and high ridges, among which are the Moorfoot Hills and the Pentland Hills, composed of porphyry. The highest point of the Pentland Hills rises 1,839 feet. The rocks of this county belong mostly to the Carboniferous and Silurian formations. Valuable coal mines are worked in the valley of the Esk. The soil is generally fertile and well cultivated. Near the metropolis, Edinburgh, are many nurseries, dairy pastures, and vegetable gardens. The county is traversed by five great railways. Pop. (1881) 389,164; (1891) 434,276; (1901) 437,553.

Edinburgh, University of: an institution of learning in Edinburgh, Scotland. It was founded in 1582 by a charter granted by James VI., of Scotland, and in 1621 the Scottish Parliament granted to it all the privileges enjoyed by other universities in the kingdom. This grant was confirmed in the treaty of union between England and Scotland, and again in the act of security. The constitution was, however, modified by the act (1858) relating to the Scottish universities, and the University of Edinburgh became a corporation consisting of a chancellor, rector, principal, professors, registered students, alumni, and matriculated students. About 3,000 students matriculate each year. The essential qualification for graduation at this as at other Scottish universities is attendance at certain series of lectures or classes. The course for the arts degree extends over four winter sessions, each lasting from the beginning of November till about the middle of April; and the degree of M. A. is conferred on all who have completed their course and passed the ordinary examinations in Latin and Greek, mathematics and natural philosophy, logic and metaphysics, moral philosophy, rhetoric, and English literature. The university comprises the faculties of arts, laws, medicine, divinity, and science. The buildings were for many years very deficient in the necessary accommodation, but much has been done in the way of improvement. The library contains nearly 200,000 volumes and 7,500 volumes of MSS., and there is also a theological library of 10,000 volumes. The chancellor is (1901) the Rt. Hon. Arthur J. Balfour, the Conservative leader. The universities of Edinburgh and of St. Andrews together have one representative in Parliament. See Sir A. Grant, *The Story of the University of Edinburgh* (2 vols., London, 1883). Revised by C. H. THURBER.

Edison, THOMAS ALVA, Ph. D.: inventor; b. at Milan, O., Feb. 11, 1847; taught to read by his mother, a Scotchwoman of some intellectual attainments; began life as a train-boy on the Grand Trunk Railway running into Detroit. Ambitious, energetic, eager for knowledge, he devoted every spare moment to study. Securing a press, he learned printing, and before long was editing and printing *The Grand Trunk*

Herald in the baggage-car of the train in which he sold his wares. A station-master, whose child he had rescued from peril, taught him telegraphy, and he entered the employ of the Western Union Telegraph Company, where he began the series of inventions which brought him world-wide fame. After brief stays in Cincinnati, Memphis, Louisville, and New Orleans he settled in Boston, where he invented his duplex telegraph in 1870; a year later he removed to New York city. In an immense and perfectly appointed laboratory, first at Menlo Park and later at West Orange, N. J., a corps of skilled investigators, working under his direction, have reduced invention to an art. The carbon transmitter, the phonograph, microphone, megaphone, incandescent lamp, and hundreds of minor inventions introduced to the commercial world with rare discernment, give him a unique position among the great inventors of the nineteenth century. In 1878 he was made a chevalier of the Legion of Honor by the French Government in recognition of his services to science and of a remarkable electrical exhibit at the International Exhibition in that year. In 1889 he was made commander of the Legion, and was also presented with the insignia of a grand officer of the Crown of Italy by King Humbert.

Ed'isto: a river of South Carolina; formed by the North and South Edisto, which unite at Edisto. The North Edisto is the boundary between Barnwell and Orangeburg Counties. The main stream flows southeastward and southward through Colleton County, and enters the Atlantic Ocean by two channels, called the North and South Edisto Inlets.

Edisto Island: an island of South Carolina (for location, see map of South Carolina, ref. 8–F); one of the most important of the Sea island group; situated between the North and South Edisto Inlets. It produces sea-island cotton.

Edkins, Joseph: See the Appendix.

Edmond, John, D. D.: Presbyterian clergyman; b. in Balfron, Stirlingshire, Scotland, Aug. 12, 1816; educated at Glasgow College and the Theological Hall of the United Secession Church. After two pastorates in Scotland, he became in 1860 pastor of the congregation in Islington, London, which two years later removed to the church now known as Park church, Highbury. He has been twice moderator of Synod, and has represented his church in the several general assemblies in the U. S. and Canada. He published *The Children's Charter* (Glasgow, 1855); *The Children's Church at Home* (2 vols., London, 1861–63; 4th ed. 1872); *Scripture Stories in Verse* (Edinburgh, 1871). Willis J. Beecher.

Edmonds, John Worth: jurist; b. at Hudson, N. Y., Mar. 13, 1799; graduated at Union College, Schenectady, N. Y., 1816. In 1819 he was admitted to the bar, and in 1820 commenced the successful practice of law in his native town. In 1831 he entered the New York Legislature as a member of the Assembly, and in 1832 became a State Senator. In 1836 he was appointed a U. S. Indian agent. In 1841 he re-entered upon the practice of law, and opened an office in New York city. In 1843 he was appointed one of the State prison inspectors, and labored with zeal and success in introducing reforms in prison discipline. In 1845 he was appointed a circuit judge, and in 1847 became one of the judges of the Supreme Court, New York. In 1852 he was appointed to the bench of the court of appeals, from which in 1853 he retired to the private practice of law, in which he was after a time a partner with Hon. William H. Field. In 1851 Judge Edmonds became a convert to Spiritualism, and in 1853–55 published, in connection with George T. Dexter, M. D., a work defending its doctrines (new ed. 1865); also *Letters and Tracts on Spiritualism* (London, 1874). D. in New York city, Apr. 5, 1874.

Edmonton: a town of Alberta, Canada; on the North Saskatchewan river; in about lat. 53° 30′ (see map of Canada, ref. 8–F). Daily weather reports are sent out from here by telegraph to the U. S. weather bureau, and severe winter storms in the Northern States often make their first appearance in the vicinity.

Edmund I.: King of the Anglo-Saxons; b. about 922 A. D.; a son of Edward the Elder and a grandson of Alfred the Great. He became king in 941, conquered the Britons of Cumbria, and re-established Watling Street as the boundary between Wessex and the Danes. He was assassinated by the robber Leofa, May 26, 946, and was succeeded by his brother Edred.

Edmund II., surnamed Ironside: King of England; b. in 989 A. D.; was a son of Ethelred II. At the death of the latter, in 1016, the Danes possessed the greater part of England. Edmund, who was renowned for courage, waged war against Canute the Dane, and gained several victories, but was defeated at Assandun. The two rivals then agreed to divide the kingdom, of which Edmund received the southern part. D. Nov. 30, 1016, and Canute then became sole king.

Edmund, Saint: See Rich, Edmund.

Edmunds, George Franklin, LL. D.: lawyer and Senator; b. at Richmond, Vt., Feb. 1, 1828; began the practice of law in 1849, and in 1851 removed to Burlington, Vt.; was a member of Vermont Legislature 1854, 1855, 1857, 1858, 1859, serving three years as Speaker; member of State Senate, and its president *pro tem.* 1861–62. He was appointed to the U. S. Senate as a Republican to fill the vacancy caused by the death of Solomon Foot, and took his seat Apr. 5, 1866; was elected for the rest of the term ending Mar. 4, 1869, and was re-elected for 1869–75, 1875–81, 1881–87, and 1887–93, but resigned in 1891 and retired to private life. He was a member of the Electoral Commission of 1876, and was elected president *pro tem.* of U. S. Senate, Mar. 3, 1883. He was the author of the act of Mar. 22, 1882, for the suppression of polygamy in Utah and the disfranchisement of those practicing it, and of a similar act passed in 1887.

Edmunds, Lewis Humfrey: See the Appendix.

Edom: a name of Esau (*q. v.*).

Edom: a country of Asia. See Idumæa.

Edred: King of the Anglo-Saxons; a son of Edward the Elder. He succeeded his elder brother, Edmund I., in 946 A. D. St. Dunstan acquired an ascendency over Edred, and was his most powerful minister. Edred died Nov. 23, 955, and was succeeded by his nephew Edwy.—Edwy, Eadwig, or Edwin the Fair, reversed the policy of his predecessor, drove Dunstan from the country, and by his misgovernment provoked Mercia and Northumberland to revolt and chose his brother Edgar for their king. On Edwy's death two years later Edgar succeeded to the throne of Wessex (959).

Edriophthal'ma [incorrectly formed from Gr. ἕδρα, seat, or ἑδραῖος, sitting, fixed + ὀφθαλμός, eye]: a group of crustaceans called the sessile-eyed crustacea, because their eyes are placed directly upon the shell, instead of being mounted upon footstalks. They have the organs of respiration connected with the organs of locomotion. None of the *Edriophthalma* attain more than an inch and a half in length. They are generally marine, though some of them of the order *Amphipoda* inhabit fresh water, and a few, belonging to the *Isopoda*, such as the wood-louse, are terrestrial but inhabit damp places. To the *Amphipoda* belong the common sandhoppers which are found along sandy shores.

Edrîsî, ed'rĕe-sēe, or **Edreese**: an Arabian geographer; b. at Ceuta, in Africa, about 1100. He was descended from the royal family of Edrisites. He traveled extensively in Europe and Asia, and passed many years at the court of Roger II., King of Sicily, by whom he was liberally patronized, and for whom he made a silver terrestrial globe. Edrîsî wrote a large book on geography, which was long a standard work. M. Jaubert published a French translation of it in 1836. D. about 1175.

Educabil'ia [Mod. Lat., deriv. of Lat. *educa're*, to educate]: a term invented by Bonaparte and applied to a group, or super-order, of placental mammals distinguished by the relatively large size of the cerebrum, which overlaps the greater part, or all, of the cerebellum and olfactory lobes; the corpus callosum is also large. The group includes the higher mammals, the orders *Primates*, *Carnivora*, *Ungulata*, *Proboscidea*, *Sirenia*, and *Cetacea*, and is opposed to the Ineducabilia (*q. v.*). F. A. Lucas.

Education [from Lat. *educa'tio*, deriv. of *educa're*, rear, nourish; connected with *edu'cere*, lead out; also of children, bring up]: in a general sense, the development and cultivation of the physical, mental, and moral powers of man; in a narrower but more usual sense, the development and training of the mental faculties.

Phases.—Education is one of the oldest of human arts, and has always responded to some human need, or to some conception of what man ought to be. In the main its aim has been practical, but at certain epochs it has aimed rather at some ideal of human perfection. In the course of history almost every conceivable phase of education has been developed and tested, and the art has been perfected by countless

experiments under all conceivable conditions. The earliest phase was doubtless the *practical*, as when a father taught his son how to construct the rude instruments needed for gaining food. Education soon became *prudential*, consisting of maxims or proverbs embodying the net results of human experience concerning good conduct. Another early phase was the *religious*, inculeating man's duties to unseen powers. *Physical* education and education for the *contemplative* life were products of Greek thought. The Jews developed a system of *industrial* education, while the Phœnicians, a trading people, devoted more attention to *commercial* training. Education for the *civil service* has been typical of China for ages. In modern times *manual training* has become one of the forms of industrial education; and *moral* training, which now receives so much emphasis, finds its type in the religious education of the Jews.

Types of Education.—All the phases of education that have been developed through the experience and thought of the race may be reduced to two main types—the *culture* or *humane* type and the *industrial* or *professional* type. Starting from the conception that the man is superior to the instrument, and that the quality of the instrument depends on the quality of the man, thinkers in all ages have devised schemes of education aiming at the perfection of human nature. The religions and ethical systems of education in vogue among ancient peoples were based on the permanent and universal needs of man, and not on his incidental needs as a workman or instrument. The culture type of education took permanent shape in Greece, and Plato's *Republic* is an exposition of a course of training befitting the ideal man, for only out of such a man could the ideal citizen be produced. Indeed, the serenity, harmony, and poise of the Greek ideal presuppose an almost entire exemption from industrial pursuits, and seem adapted to beings leading a purely contemplative life. In order that arithmetic may serve its highest purpose, Plato expressly states that it must not be taught for commercial purposes, as to shopkeepers and merchants. This type of education has persisted through the ages, and has a clearly marked place in the schools of to-day. The classics, the belles-lettres, history, music, and art are humane studies, and the general pursuit of the sciences is best defended on the ground of their culture value—they interpret nature for purposes of contemplation.

Roman education was as distinctively practical or professional as the Greek was humane; it provided for a select few a career in the army or in the forum. All schemes for industrial, commercial, or professional education belong to this type; they regard man chiefly as an instrument, and their direct purpose is the narrow one fitting him to earn a livelihood. This may be called the popular type of education, for among the people at large the notion is thoroughly ingrained that the chief end of school training is to fit the young for "getting on in the world." Alexander Bain speaks of the difficulty of reconciling the whole man with himself, that is, of bringing the instrument into harmony with the man, and this is doubtless the most difficult problem of modern education. The ideal is to make all education, high and low, of the culture or liberal type, and at the same time to guard the child's interests as a wage-earner; but this ideal is hard to realize.

The Patrons of Education.—The earliest education was domestic, and the best type of this home-school existed among the ancient Jews, where the father was the teacher and the law of Moses the text. Later, through that differentiation of function which is common to all peoples advancing toward civilization, the teaching office was relegated by the family to the Church, and for centuries the Church was the patron of the school, as it continues to be in some countries at the present day. But education gradually became secularized, especially in three ways: subjects not essentially religious, as history and science, have been given a place in the education of the young; laymen have been admitted to the teaching office; and the state has gradually displaced the Church in the patronage of the school. In all the progressive nations of modern times education has become to a greater or less degree a function of the state. The secularization of the school is most complete in France, where ecclesiastics are excluded by law from teaching; but in all other countries in which education is administered by the state the Church is not molested in her right to maintain parochial schools. The modern state has become a public educator on the ground of self-preservation, holding that ignorance is a menace to the national life, and therefore claiming the right to diffuse enlightenment among its citizens. The secularization of the school is the logical outcome of the rising democratic spirit which characterizes modern nations. An ignorant and degraded people may be governed, but only an enlightened and virtuous people is capable of self-government. This modern doctrine of education by the state was embodied by Plato in his *Republic*, where it is followed out to the extreme of giving the state complete ownership of children, and even sanctioning the destruction of the sickly.

The Old and the New.—Essential changes in modes of human thought have always been followed by corresponding changes in education; and a new philosophy which profoundly affects the religious nature necessarily gives rise to a new education. As the Reformation wrought a radical change in men's religious philosophy and practice, there is eminent propriety in speaking of the general system of education in vogue before the Reformation as the Old, and of the system that had its rise at that period as the New. There was not an abrupt cessation of the old order of things, for what was essentially good and true necessarily passed into the new order of things. The old education was based essentially on authority; the child was mainly a passive recipient, and his warrant for believing the truth of what he was taught was the authority of the book or of the master. The one great principle of learning was to believe and take for granted, to assume the accuracy of authorized statements without asking questions and without mental unrest. It is not difficult to see how such a conception of teaching and learning resulted from a system of education based on a religion in which dogma played a very large part. Again, the older system of education was addressed almost entirely to the memory, and learning was but little more than memorizing a text or a formula verbatim. In this particular the influence of religious training is also manifest. Not only was the thought or content of a text held sacred, but so also was the form of words in which it was embodied; and the effectual way to lodge the truth in the soul was to lodge the verbal expression of it in the memory.

The later system of education embodies a reaction against the abuses of authority and memory. It appeals to free inquiry, and involves the exercise of the learner's own powers of thought and discovery. A thing is true, not because some one has declared it to be true, but because it has the sanction of one's own reason and experience. The modern teacher therefore addresses the pupil's powers of observation, reflection, and reason, rather than his memory; and learning becomes a process of discovery rather than a servile following of authority. The product of the teacher's art is not to be a disciple, docile and reverent, but an independent thinker, capable of reaching his own conclusions. The older system erred by exaggerating the importance of authority and memory, but the reaction of the modern system threatens to involve education in errors of equal gravity. A distrust of authority is as absurd as a distrust of reason; and education can no more dispense with memory than it can with observation and free inquiry. The ideal system of education is to be found in maintaining the just equilibrium between the old and the new tendencies.

Universality.—Generally speaking, ancient education affected only a select number of minds, while the masses of the people were left uninstructed and unenlightened. Historically, universities preceded common schools. The Reformation made the education of the common people a necessity, but it was left to the genius of Comenius to devise a system of graded instruction which has made possible the downward diffusion of culture. The greatest achievement of modern education is the gradation and correlation of schools, whereby the ladder of learning is let down from the university to secondary schools, and from these to the schools of the people.

The aim of modern education, as administered by the state, is universality, though the organization for effecting it from above downward is partial and incomplete. Even with the conception of Comenius generally embodied in a working organization, as it is in Germany and in some of the U. S., two subsidiary measures are still necessary in order to make education universal: free schools should be provided, and school attendance should be made compulsory; without the first the second will often work hardship. In the U. S. the public schools are free, but in some sections illiteracy exists to an alarming extent. In some of the States there has been a resort to compulsion, but in most cases the laws on this subject are only partially effect-

ive. In Germany, although the public schools are not entirely free, every child is compelled to attend school, and illiteracy does not exist. Compulsory attendance prevails to some degree throughout the greater part of Europe; and wherever it is proposed to make education universal this must ultimately be resorted to.

Education Values.—Plato and Aristotle, Lord Bacon, Sir William Hamilton, Alexander Bain, and Herbert Spencer have discussed the value of subjects as they affect human education. Lord Bacon comes nearest to a classification of values when he says that "studies serve for ornament, for delight, and for ability." Doubtless no one to-day would take the first of these into serious account, and it is evident by Bacon's comment on the term "ability" that he includes under it what are now designated the disciplinary and the practical values of a subject; so that a real science of education values is based on a recognition of these three distinct effects of a study: it may yield contemplative delight, it may train the mental faculties, or it may give power to attain practical ends. The three education values are therefore the *culture*, the *disciplinary*, and the *practical*. Every study has a major or characteristic effect, and may have one or both of two minor effects. Thus geography is in the main a culture subject, though it also has some practical value and a lower disciplinary value. The major value of algebra lies in its disciplinary effect; it has a low practical value, while its culture effect is almost nothing. As a general rule, the practical value and the disciplinary value of a subject are inversely proportional. The development of a science of education values would determine a rational curriculum. See SCHOOLS and UNIVERSITY.

AUTHORITIES.—Plato, *Republic* and *Laws*; Aristotle, *Ethics* and *Politics*; Quintilian, *Institutes of Oratory*; Plutarch, *Moralia*; Comenius, *Didactica Magna* and *Orbis Pictus*; Rabelais, *Gargantua*; Montaigne, *Essays*; Rousseau, *Émile*; Pestalozzi, *How Gertrude Teaches her Children*; Richter, *Levana*; Froebel, *Education of Man*; Ascham, *Schoolmaster*; Locke, *Thoughts*; Spencer, *Education*.

W. H. PAYNE.

Edward (surnamed THE CONFESSOR): an Anglo-Saxon King of England; b. at Islip in 1004. He was a son of Ethelred II. After the death of Ethelred, in 1016, Canute the Dane became master of the kingdom, and married Emma, the mother of Edward. In 1042 Edward came to the throne, succeeding his half-brother Hardicanute. He married Editha, a daughter of Earl Godwin, but did not permit her to share his bed, and for this and other ascetic virtues was surnamed "The Confessor." D. Jan. 5, 1066, and was succeeded by his wife's brother, Harold. Edward the Confessor is honored as a saint in the Roman Catholic Church.

Edward I. (surnamed LONGSHANKS): King of England; eldest son of Henry III. and his wife Eleanor; b. at Westminster in 1239. He fought for his father against the barons in the war which began in 1263. In 1265 he gained a decisive victory at Evesham. He took part in a crusade to Palestine in 1271, and returned to England and took his deceased father's throne in 1274. The conquest of Wales he completed in 1282, after a war of several years. In 1291 several competitors for the crown of Scotland recognized Edward as lord paramount, and chose him as umpire. He decided in favor of John Baliol, who took the oath of fealty to the English king. The Scots took up arms to maintain their independence. In 1296 Edward invaded Scotland, dethroned Baliol, and made himself master of the kingdom. The national cause was bravely defended by Sir William Wallace, who gained a victory at Stirling in 1297, but was himself defeated by Edward at Falkirk in 1298. Edward again invaded Scotland in 1303, and in 1305 captured Wallace, who was then hanged as a traitor. The English king was marching against Robert Bruce, who had renewed the contest, when he died near Carlisle, July 7, 1307. Edward was an ambitious and able ruler, having great political talents, as well as military genius. He greatly promoted the improvement of law and the reformation of civil abuses. Among the important events of his reign was the institution of the House of Commons. He was succeeded by his son Edward II.

Edward II.: King of England; fourth son of Edward I. and Eleanor; b. at Carnarvon, Apr. 25, 1284; became heir-apparent in 1285; was created Prince of Wales in 1301; and succeeded his father in 1307. He was weak and indolent, and utterly incompetent. Immediately after his accession to the throne he recalled Piers Gaveston, made him guardian of the kingdom while he himself went to France, and loaded him with so many honors and presents that the nobles demanded securities before consenting to the coronation of the king. In 1312 the nobles revolted and executed Gaveston, but he was followed by Despenser. Lagging in the prosecution of the Scotch war till Bruce had regained much of what had been lost, Edward at last undertook the invasion. The result was the utter defeat of the English in the great battle of BANNOCKBURN (*q. v.*) in 1314. In 1327 Edward was deposed by Parliament, and shortly after was assassinated.

Edward III.: King of England; eldest son of Edward II.; b. at Windsor, Nov. 13, 1312. He ascended the throne Jan. 29, 1327, but during his minority the royal power was exercised by the queen-mother and Roger de Mortimer. Edward married Philippa of Hainault in 1328. In 1330 Mortimer was arrested, tried, and executed by the order of the young king, who then assumed the royal power. To support Edward Baliol, who claimed the Scottish throne at the death of Robert Bruce, Edward invaded Scotland, and defeated the Scotch at Halidon Hill in 1333. The Scottish people generally refused to recognize Baliol, and although the English army ravaged their country in several campaigns, they again and again rallied and fought resolutely for independence. When his uncle, Charles IV. of France, died without male issue, Edward claimed the throne of France, but Philip of Valois was recognized by the French people. The English king began war in 1339, but hostilities were several times suspended by truce. In 1346 Edward, with his son, the Black Prince, invaded France, marched to the gates of Paris, and gained a complete victory at Crécy (Aug. 26). He took Calais after a siege of several months in 1347, and a long truce was then concluded between the two powers. The war having been renewed in 1356, the Black Prince defeated the French at the great battle of Poitiers Sept. 19 of that year, and took King John prisoner. In 1360 the war was suspended by the treaty of Brétigny, in accordance with which Edward was promised a ransom of 3,000,000 crowns for King John and retained the French provinces which he had conquered. King John's successor, Charles V., renewed the war in 1370, gained a series of victories, and recovered nearly all the French territory which the English had occupied. Edward died June 21, 1377, and was succeeded by his grandson, Richard II. He was popular, and left a high reputation for ability.

Edward IV.: King of England; b. at Rouen in 1442; son of Richard, Duke of York. After the death of his father in 1460 Edward was the head of the house of York, then waging a civil war against the Lancastrians, who fought for Henry VI. Edward gained a victory at Mortimer's Cross, near Hereford, entered London in February, and was proclaimed king Mar. 4, 1461. His courage, handsome person, and other popular qualities rendered him a favorite of the people of London. The cause of the Lancastrians was supported by Margaret of Anjou, the ambitious queen of Henry VI., whose army was defeated at Towton in Mar., 1461. Edward gained another victory at Hexham in 1464, and next year took Henry VI. a prisoner. By his marriage with Elizabeth Woodville (1464) Edward offended the Earl of Warwick, the most powerful of his subjects. Warwick expelled Edward from the country in 1470; but the latter returned in 1471, defeated Warwick at Barnet (Apr. 14), and recovered the throne. On May 4, 1471, he gained a decisive victory at Tewkesbury, which ended the War of the Roses. D. Apr. 9, 1483.

Edward V.: King of England; b. in Westminster, Nov. 4, 1470; eldest son of Edward IV., whom he succeeded Apr. 9, 1483. His uncle, Richard, Duke of Gloucester, obtained possession of the person of Edward V., and became protector of the kingdom. The young king and his brother disappeared in June, 1483, and probably were murdered in the Tower by the order of Richard, who then usurped the throne.

Edward VI.: King of England; son of Henry VIII. and Jane Seymour; b. at Hampton Court, Oct. 12, 1537, and succeeded his father Jan. 28, 1547. His uncle, Edward Seymour, Earl of Hertford (afterward Duke of Somerset), acted as regent, with the title of lord protector. The latter promoted the Protestant cause. During this reign the images were removed from the churches, the articles known as the "Bloody Statute" were repealed, and the Reformation made great progress in England. Somerset invaded Scotland, because the Scottish Government refused to form a

matrimonial alliance between Mary Stuart and Edward VI. He defeated the Scots at Pinkie in 1547. Somerset's enemy, John Dudley, Earl of Warwick, obtained the ascendeney in 1550, and eaused him to be exeeuted. Dudley persuaded the young king to exelude the princesses Mary and Elizabeth from the throne, and to appoint Lady Jane Grey as his successor. Edward died July 6, 1553. See Sharon Turner, *History of the Reigns of Edward VI., Mary, and Elizabeth* (1829); Froude, *History of England*.

Edward VII.: King of England; eldest son of Queen Vietoria and Albert, Prince Consort; b. in Buekingham Palace, London, Nov. 9, 1841. Suceeeded his mother, upon her death, Jan. 22, 1901. He took the oath as king in St. James's Palace, Jan. 23, 1901, and was proclaimed the following day. He was edueated in childhood by private tutors, and after reaching his majority studied at Edinburgh, at Christ College, Oxford, and Trinity College, Cambridge. In 1860 he visited Canada and the U. S. He married, Mar. 10, 1863, Princess Alexandra of Denmark. In 1875–76 he visited India. His first speeeh in the House of Lords, in 1884, was in support of a measure for the better housing of the poor, and led to his appointment as commissioner to study the subject. He is democratie in his tastes, a patron of the stage, and widely known for his interest in all kinds of sports. His eldest ehild, Prinee Albert Victor Christian Edward, Duke of Clarenee, b. at Frogmore, Jan. 8, 1864; d. Jan. 14, 1892. His seeond son, Prince George Frederiek Ernest Albert, Duke of York, b. June 3, 1865, sueeeeded, on his father's accession to the throne, to the title of Duke of Cornwall. The younger children are Princess Louise Victoria Alexandra Dagmar, b. Feb. 20. 1867 (married the Duke of Fife, July 27, 1889); Prineess Victoria Alexandra Olga Mary, b. July 6, 1868; Prineess Maud Charlotte Mary Vietoria, b. Nov. 26, 1869 (married Prinee Charles of Denmark, July 22, 1896); Prinee Alexander, b. April 6, 1871, d. April 7, 1871.

Edward: Prinee of Wales, called the **Black Prince** (from the eolor of his armor); b. June 15, 1330; the eldest son of Edward III. of England and Philippa; was ereated Duke of Cornwall in 1337 and Prinee of Wales in 1343. He eommanded a part of his father's army at the battle of Créey (1346), and then adopted the crest of ostrich feathers and the motto *Ich dien* (I serve), whieh erest and motto had been borne by John, King of Bohemia, who was slain at that battle. Ever sinee, it has been borne by the Prinees of Wales. In 1355 Edward commanded the prineipal of the three armies raised by the English for the invasion of Franee. Landing at Bordeaux he took the city, and in 1356 gained a brilliant vietory over the Freneh at Poitiers, where he took their king, John, a prisoner. In 1361 he married his eousin Joanna, a daughter of the Earl of Kent, and reeeived from his father the title of Prinee of Aquitaine. In his new possessions he lived for a long time a quiet life, until drawn into Spanish polities. He defeated Henri de Transtamare in battle, and in 1367 restored Henri's rival, Peter the Cruel, to the throne of Castile. The heavy taxes eaused by the Spanish campaign brought about rebellion in Aquitaine, and Limoges fell into the hands of the French by treason. Edward retook it and ordered every living being in the city to be killed, elosing his military eareer with this aet of unparalleled cruelty. He shortly after returned to England, utterly broken in health. D. June 8. 1376, leaving a son, who became king as Riehard II. See Creighton, *Edward the Black Prince* (London, 1869).

Edwards, Amelia Blandford, L. H. D., LL. D.: novelist and Egyptologist; b. in London in 1831. Among her novels are *My Brother's Wife* (1855); *Barbara's History* (1864); and *In the Days of My Youth* (1872). In her later years she devoted her attention mainly to Egyptology and Egyptian exploration, and was the chief promoter of the Egyptian Exploration Fund. She published *A Thousand Miles up the Nile* (1877) and *Pharaohs, Fellahs, and Explorers* (1892); translated Maspero's *Egyptian Archæology* (1887); contributed artieles on Egyptology to the *Encyclopædia Britannica*; and was secretary of the Egypt Exploration Fund. D. Apr. 16, 1892. H. A. Beers.

Edwards, Bryan: English West Indian merchant and historian; b. at Westbury, Wiltshire, May 21, 1743. In 1760 he went to live with his unele, a merehant in Jamaiea, who gave him the means of eompleting his education and ultimately took him into partnership. On his nnele's death he fell heir to the business. In 1791 he visited the revolted districts of Santo Domingo, and in 1792 he returned finally to England, where he settled at Southampton and opened a bank. He was elected to Parliament in 1796, and in that position opposed the abolition of the slave-trade. Mr. Edwards is best known for his *History of the British Colonies in the West Indies* (1793–94; new edition, with additions, 5 vols., 1819) and his *Historical Survey of St. Domingo* (1797). He published tracts and a volume of poems. D. at Southampton, July 15, 1800. Herbert H. Smith.

Edwards, Bela Bates, D. D.: theologian; b. in Southampton, Mass., July 4, 1802; graduated at Amherst College in 1824, and at Andover Theological Seminary 1830. In 1833 he founded the *American Quarterly Observer*. He became editor of the *Biblical Repository* in 1835; Professor of Hebrew at Andover in 1837; and editor of the *Bibliotheca Sacra* in 1844. In 1848 he beeame Professor of Biblical Literature at Andover Seminary. He was equally distinguished for the exaetness of his seholarship and for the modesty and beauty of his character. He published a *Life of Elias Cornelius* (1842), a work on the Epistle to the Galatians, and other works. Two volumes of his sermons, addresses, ete., with a memoir were published in Boston in 1853. D. at Athens, Ga., Apr. 20, 1852.

Edwards, Henri Milne: See Milne-Edwards.

Edwards, Jonathan: divine and metaphysician; b. at East Windsor, Conn., Oct. 5, 1703; son of Timothy Edwards, a man of uneommon learning for those times, who was minister at East Windsor. His mother, a woman of superior intellect and attainments, was a daughter of Rev. Solomon Stoddard, of Northampton, Mass. Jonathan is said to have begnn the study of Latin when only six years old. When he was ten years of age he composed an essay in whieh he ridieuled the idea, which some one had recently put forth, of the materiality of the human soul. In 1716 he entered Yale College, and gradnated in 1720. Strong religious impressions appear to have been made on his mind in early childhood, bnt he dated his "eonversion" from about his seventeenth year, after which all nature seemed changed in his view, everything revealing to his purified understanding the wisdom, glory, and love of God. In 1723 he took at Yale the degree of master of arts. He was tutor at Yale 1724–26. In the early part of 1727 he was settled as pastor of the chureh at Northampton, Mass. He was soon after married to Sarah Pierrepont, the daughter of Rev. James Pierrepont, of New Haven, who resembled him in the sweetness and purity of her spirit, in the elevation of her character, and in her entire devotion to duty. After many years of comparative peaee and happiness a difficulty arose in his eongregation whieh put his firmness and eonseientiousness to a severe test. It had become a custom in the church to admit to the communion-table all who professed with the eongregation, without any inquiry as to whether they had been truly eonverted, or whether their spirit and life were eonsistent with their external profession. Jonathan Edwards was opposed to "the half-way eovenant," as it was called. But his attempted reform eaused great dissatisfaction, and he was at length driven forth from his eongregation, June 22, 1750, not knowing whither to go and without any means of support for his family. In 1751 he became missionary at Stoekbridge, among the Housatonic Indians, and pastor of the white chureh there. About this time he wrote out his eelebrated treatise on the *Freedom of the Will*, the plan of which had been matured. it is said. while he was still a student at eollege. In 1757 he was appointed president of Princeton College in New Jersey, where he died Mar. 22, 1758.

Among his various writings are a *Treatise concerning the Religious Affections* (1746), and *An Inquiry into the Qualifications for Full Communion in the Church* (1749); his great work, *An Inquiry into the Modern Prevailing Notions Respecting that Freedom of the Will which is Supposed to be Esseutial to Moral Ageucy* (1754); *The Great Christian Doctrine of Original Sin Defended* (1757); and *The History of Redemptiou*. His works were published at Woreester, Mass.. in 1809, in eight volumes; and again, including much new material, in New York, 1830, in ten volumes. A work of his, entitled *Charity and its Fruits*, was published in 1852 for the first time. See his *Life*, by Sereno Edwards Dwight (New York, 1830), Samuel Hopkins, and in Sparks's *American Biography*, by Samuel Miller, and by A. V. Allen (Boston, 1889).

Edwards, Jonathan, D. D.: theologian; son of Jonathan Edwards, and commonly known as "the younger Ed-

wards"; b. at Northampton, Mass., May 26, 1745; graduated at Princeton in 1765; minister of a Congregational church at New Haven, Conn., from 1769 to 1795; pastor of the Congregational church at Colebrook, Conn., 1796–99. He became president of Union College, Schenectady, in 1799. He prepared for the press a number of his father's writings. His principal works are the treatise on *Liberty and Necessity* (1797); his reply to Chauncey's book on universal salvation (1789); and his *Discourses on the Atonement* (1785). They were published at Andover, 1842, 2 vols., with *Life* by Tryon Edwards. D. in Schenectady, N. Y., Aug. 1, 1801. Revised by GEORGE P. FISHER.

Edwards, JULIAN: See the Appendix.

Edwardsville: city (settled in 1812); capital of Madison co., Ill. (for location of county, see map of Illinois, ref. 8–D); on four railways and on Cahokia creek, 18 miles N. E. of St. Louis, Mo. It has coal mines, brickyards, machine-shops, and a manufactory of carriage poles. In the suburb Leclaire are large shops for the manufacture of sanitary supplies. They are managed on the co-operative plan and the workmen are very prosperous. Pop. of Edwardsville (1890) 3,561; (1900) 4,157.

Edwy, Eadwig, or **Edwin the Fair**: King of England. See EDRED.

Eeckhout, āk'howt, GERBRAND, van den: painter: b. at Amsterdam, Holland, Aug. 19, 1621; a pupil of Rembrandt, whom he imitated with success. He especially excelled in portraits, and was very skillful in the expression of character. Among his best-known pieces is *Christ and the Doctors*, in the Munich Pinakothek, and a remarkable portrait in the Städel Gallery at Frankfort. He was also an etcher, and his prints are valued by collectors. D. July 22, 1674.

Eecloo, ā-klō': a town of Belgium, province of East Flanders; 11 miles N.W. of Ghent (see map of Holland and Belgium, ref. 9–C). It has a convent and several churches; also salt-refineries, oil-mills, and manufactures of cotton and woolen fabrics, hats, soap, tobacco, etc. Here is a large weekly market for grain. Pop. (1891) 11,648.

Eel (O. Eng. *ēl*: O. H. G. *āl*, Mod. Germ. *Aal*): any one of many fishes of elongated and more or less serpentine shape, belonging to the *Anguillidæ*. The best-known species is *Anguilla anguilla*, found in both salt and fresh water on both sides of the Atlantic, although the American eels differ sufficiently from the European to entitle them to be considered at least a subspecies, *Anguilla anguilla chrysypa*. The common eel is found from Maine to Mexico east of the Rocky Mountains, while it is spread over Europe south of 64° 30′, and around the Mediterranean area, but it does not occur in the Danube or in the Black and Caspian Seas; neither is it found in the Pacific. Common as it is, its mode of reproduction has but very recently been discovered, largely through the difficulty of distinguishing the two sexes, the eggs being extremely minute. It is now known that eels spawn on the sand and mud at the mouths of rivers, moving down-stream for this purpose during the dark nights of autumn. In the spring the young eels ascend the rivers in immense numbers, climbing dams and passing over or under all manner of obstructions. The habits of the eel are, in respect to their migrations, exactly opposed to those of the salmon and herring. Eels are voracious, eating almost anything alive or dead, poking their noses into every imaginable hole in search of food, and hunting assiduously among stones for shrimps or crawfish, of which they are very fond. They are caught in quantities in wickerwork traps, and many are speared in winter, for it is their custom to pass the cold weather buried in the mud, often associated in considerable numbers. They are an excellent article of food, although prejudice keeps many people from eating them. See also CONGER EEL, ELECTRIC EEL, and MURÆNA. F. A. LUCAS.

Eel: a river of Indiana; rises in Allen co., flows southwestward, and enters the Wabash at Logansport. It affords abundant water-power. Length about 100 miles. Another Eel river rises in Boone co., Ind., and after a course of nearly 100 miles enters the West Fork of White river, in Greene co.

Eelee: same as ILI (*q. v.*).

Effect [from Lat. *effec'tus*, deriv. of *efficere*, bring about, accomplish: *ex*, out + *fa'cere*, make]: that which is produced by a cause or agent; a result of causation; a consequence; validity; reality. Cause and effect are correlative terms in natural science. In the plural, effects signifies goods, chattels, or personal property. In the fine arts, effect is that quality whose tendency is to give particular efficacy to other qualities, so as to attract the eye of the spectator, or the impression produced by a picture seen at a distance so great as to render the details invisible. See CAUSE.

Effervescence [from deriv. of Lat. *efferves'cere*, begin to boil; *ex*, out + *ferve're*, be hot]: the agitation caused by the sudden escape of gas when certain substances are mixed or combined; the escape of gaseous matter from liquids. An example of effervescence is seen when calcium carbonate is put into dilute acid. All liquids from which bubbles of gas escape rapidly are said to *effervesce*.

Effervescing Powders: medicines of various kinds, usually put up in two papers—one containing an alkaline bicarbonate, and the other citric or tartaric acid. After dissolving and mixing the solutions, carbonic acid escapes with effervescence. These powders are useful refrigerants, and are gently laxative. Rochelle salts are often added to increase the laxative effect, constituting Seidlitz powders.

Effingham: city and railway junction; capital of Effingham co., Ill. (for location of county, see map of Illinois, ref. 8–F); 98 miles E. N. E. of St. Louis, and 199 miles S. by W. from Chicago. It has extensive manufactures. Pop. (1880) 3,065; (1890) 3,260; (1900) 3,774.

Effort: See the Appendix.

Eft, or **Ev'et**: the popular name of many small lizards and of several tailed batrachians. One of the best known is the common red salamander (*Salamandra rubra*), a batrachian of the U. S. There are numerous allied species, which are incorrectly believed by many to be venomous.

Ega, or **Egas**: See TEFFÉ.

Egalité, *ā'găă'lĕĕ'tā'* [Fr., equality < Lat. *aequa'litas*, deriv. of *aequa'lis*, equal, *aequus*, even]: one of the popular watchwords of the first French revolution—*Liberté, égalité, fraternité* (Liberty, equality, fraternity). The Duke of Orleans (1747–93) assumed in 1792 the name of "Citizen Égalité," but he was guillotined nevertheless. See ORLEANS, LOUIS PHILIPPE JOSEPH, DUKE OF.

Egan, MAURICE FRANCIS: scholar and author; b. in Philadelphia, Pa., May 24, 1852. From 1881 to 1888 he was editor of the New York *Freeman's Journal*. He then became Professor of English in the University of Notre Dame, and later in that of Washington. Author of *That Girl of Mine* (1879); *Songs and Sonnets* (1886); and *Lectures on English Literature* (1889).

Egan, PIERCE: author, artist, and journalist; b. in London, of Irish descent, in 1814; son of Pierce Egan (1772–1849), also an author. He published more than twenty novels, among which are *Robin Hood*, *The Flower of the Flock*, and *The Poor Girl*. He furnished many excellent designs on wood for the *Illustrated London News*, and was long an editor in London. He contributed frequently to journals in England and the U. S. D. July 6, 1880.

Egaña, JUAN: Spanish-American jurist, author, and statesman; b. at Lima, Peru, 1767. He graduated in the College of Santo Toribio, and taught philosophy there before he was seventeen years old. Later he went to Santiago, Chili, where he won great distinction as a lawyer. He took a leading part in the revolution of 1810, and was one of the most active and liberal members of the first Chilian congress. On the defeat of the patriots in 1814 he refused to retire from the country, was seized by the Spaniards, and imprisoned at Juan Fernandez until set free by San Martin's victories in 1817. He was almost immediately elected again to the Chilian congress, where he distinguished himself by his wisdom and moderation. In later years he retired from public life. Dr. Egaña's literary works embrace essays on political, legal, educational, and religious subjects, poems, and text-books. D. at Santiago, Apr. 13, 1836.

Egbas: See the Appendix.

Egbert: King of the West Saxons; b. about 775; a descendant of Cerdic. He passed many of his early years at the court of Charlemagne, and began to reign in 800 A. D. At this date England was divided into three separate kingdoms, Mercia, Northumbria, and Wessex. He defeated the Mercians at Ellandun in 823, soon after which he completed the conquest of Mercia and Northumbria, ruled over all the states of the Heptarchy, and styled himself "the King of the English." In 835 he defeated an army of Danes who had invaded England. He died in 836 A. D., and was succeeded by his son Ethelwulf. See Lappenberg's

History of England under the Anglo-Saxon Kings (translated by Thorpe, 1845.)

Egede, eg'*e*-de, Hans: the apostle of Greenland; b. at Harstad, Norway, Jan 31, 1686. He became pastor of the church at Vaagen in 1707. After long endeavors he succeeded in interesting the Danish authorities in his project for the conversion of the Esquimaux, and in 1721, accompanied by his wife, he set out for Greenland, where he labored for some fifteen years, enduring many hardships but meeting with marked success. The death of his wife (1735) and his own failing health compelled his return to Copenhagen in 1736, but he continued to work for the cause, and was appointed superintendent, or missionary bishop, of Greenland in 1740. He wrote an account of his missionary labors, *Relation angaaende den grønlandske Missions Begyndelse og Fortsættelse* (1738), and a description of the island, *Det gamle Grønlands nye Perlustration* (1729; 2d and enlarged ed. 1741). D. Nov. 5, 1758. (See Rudelbach, *Christliche Biographie*, i., 284 ff.)—His son Poul, b. Sept. 9, 1708, went with his parents to Greenland in 1721, where he remained, except for the time necessary for his education (1728–34), till 1740, assisting and finally succeeding his father. In 1779 he was appointed missionary bishop of Greenland. His publications include a valuable Esquimaux dictionary (1750) and grammar (1760), an Esquimaux translation of the New Testament (1766), and an *Account of Greenland* (*Efterretningen om Grønland*, 1788).

G. L. Kittredge.

Eger: town of Bohemia; situated on the river Eger (which enters the Elbe 33 miles N. N. W. of Prague), 92 miles W. of Prague; at the junction of six railway lines (see map of Austria-Hungary, ref. 3–C). It is built on a rock, and was an important fortress. Here are the ruins of a citadel or castle, formerly the residence of kings and emperors. Eger has 7 churches, a fine town-hall, and 2 monasteries; also manufactures of broadcloth, cotton goods, chintz, and soap. Wallenstein was assassinated here Feb. 25, 1634. Near Eger is the watering-place Franzensbad, with five springs. Pop. (1890) 18,658.

Ege'ria: a nymph who, according to the Roman mythology, was one of the Camenæ, and was a prophetic divinity from whom Numa derived religious inspiration and directions respecting the forms of worship. The poets feigned that Numa had interviews with her in a grove, and that when he died she melted away in tears, which became a fountain. An asteroid discovered at Naples by De Gasparis in Nov., 1850, bears the name of Egeria.

Egerton, Francis Henry: See Bridgewater, Earl of.

Egerton, ej'er-tŭn, Francis Leveson Gower, Earl of Ellesmere: author and patron of art; b. in London, Jan. 1, 1800. He was the second son of the first Duke of Sutherland, and his original name was Francis Leveson Gower, but he assumed the name of Egerton in 1833, when he inherited the estate of the last Duke of Bridgewater. He entered the House of Commons in 1820, became chief secretary for Ireland in 1828, and was Secretary at War for several months in 1830. He wrote several books, including a poem called *The Camp of Wallenstein*. He was created Earl of Ellesmere in 1846. D. Feb. 18, 1857.

Egg [loan-word from Norse *egg*: O. Eng. *æg*: Germ. *Ei*; closely connected if not identical with Lat. *ō'vum*, Gr. *φόν*]: the specialized cell in the female of all animals which is set apart for the sexual reproduction of the species. In its typical condition it is such a cell without accessory portions, but usually there are added various envelopes and substances for the protection and nourishment of the germ which is to form later. In the eggs of the birds these secondary envelopes, etc., reach their highest development. Here there is an outer calcareous shell perforated by minute holes for the passage of air, which later is needed for respiration; next within this is a tough (double) shell membrane, which contains the white or albumen. In the white, supported by a twisted membrane (chalazæa) at either end, floats the yolk, and on the upper side of the latter is a circular, lighter spot, the germ. The bulk of the yolk is nourishment, and is not directly, but as food, converted into the chick. In some forms eggs are capable of development without fertilization (see Parthenogenesis). Some eggs, like those of Hydra, are without envelopes. Others, like insects, have but a single outer coat. The largest known egg is that of the extinct Æpyornis of Madagascar, the shell of which has a capacity of about 2 gal., or about six times that of the ostrich-egg. Aside from food, birds' eggs find considerable use in the arts, as a source of albumen which is used for the preparation of photographic paper, etc. Egg albumen differs considerably chemically from that derived from blood. See Food, Embryology, and Evolution; also, for the egg of insects, Entomology.

J. S. Kingsley.

Egg, or **Eigg**: an island of Scotland; 8 miles S. W. of Skye, and 12 miles from the west coast of Inverness-shire. Length, 4½ miles. Here are some remarkable cliffs of trap or basalt, and columns of pitchstone nearly 2 feet in diameter.

Egga: See the Appendix.

Eg'gan: a populous town of Africa; in the British Niger Territory; on the right bank of the Niger; in lat. 8° 42′ N. and lon. 6° 20′ E. (see map of Africa, ref. 4–C). It extends nearly 2 miles along the river. The dwellings are mostly small huts of clay. Narrow cotton cloth is manufactured here in large quantities. Eggan has an active trade in corn, yams, calabashes, dried fish, etc. Pop. 12,000.

Egg-bird, or **Sooty Tern** (*Sterna fuliginosa*): a bird belonging to the gull family, having the back and wings sooty black and the under parts white. The wings and tail are long and pointed, the latter deeply forked. It abounds in the West Indian seas and in Florida, and was formerly so abundant that its eggs, which are laid in a slight depression in the sand, formed an article of commerce.

Eg'ger, Émile, Dr. Lit.: classical scholar; b. of German parents in Paris, July 13, 1813; received his degree in letters in 1833. Held various professorships of ancient languages, and was a member of the French Academy and an officer of the Legion of Honor. A learned and prolific author. Among his best-known works are *Mémoires d'Histoire et de Philologie* (1863); *L'Hellénisme en France* (2 vols., 1869); *Essai sur l'Histoire de la Critique chez les Grecs* (1890); *La Littérature Grecque* (1890). D. at Royat, Aug. 31, 1885.

Alfred Gudeman.

Eggleston, Edward: novelist and historian; b. in Vevay, Ind., Dec. 10, 1837; joined the Methodist ministry in his nineteenth year, and preached during ten years in Minnesota. He began his literary career in 1866 as editor of *The Little Corporal* (Evanston, Ill.); founded in 1867 the *Sunday-school Teacher* (in Chicago); in 1870 went to New York city and became literary editor of *The Independent*; was some time editor of *Hearth and Home*. In 1871 appeared his *Hoosier Schoolmaster*, a novel which has been several times translated; *The Circuit Rider* (1874); *Roxy* (1878); *The Graysons* (1888); *The Faith Doctor* (1891); a popular school *History of the United States* (1888); *The Beginners of a Nation* (1896); and *The Transit of Civilization* (1900).

Eggleston, George Cary: journalist; brother of Edward Eggleston; b. at Vevay, Ind., Nov. 26, 1839. He was in the Confederate service during the civil war. Since 1870 he has been connected with periodicals in New York; was chief editor of *The Commercial Advertiser* 1886–89, and an editorial writer on *The World* since then. Published *A Rebel's Recollections* (1875); *American War Ballads and Lyrics* (1889); *Juggernaut* (1891); and *A Carolina Cavalier* (1901).

Egg-plant (*Sola'num melon'gena*, var. *esculen'tum*): a plant of the nightshade family, of the same genus as the

Egg-plant.

potato. It is cultivated for its large fruits, which are eaten when cooked in a variety of ways. It has been cultivated from the earliest times, and its native country is supposed

TYPES OF BIRDS' EGGS

to be India. It requires a long season for maturity, and is therefore not extensively cultivated in the Northern U. S. It is exceedingly variable, the dozen varieties which are commonly grown in the U. S. representing three or four distinct types. The most popular varieties are the large purple sorts, of which one (the New York Improved) is shown in the engraving. Some of the early dwarf purple sorts are more reliable for cultivation in the Northern U. S. There are a few white-fruited varieties, but, although they are scarcely inferior to the purple sorts, they are not popular. The egg-plant requires a loose, rich soil, and in the Northern States it should be started early under glass, and care should be taken that the plants do not become root-bound or stunted before they are set in the field. In France the egg-plant is known as aubergine, and in the Southern U. S. it is sometimes called Guinea squash. L. H. Bailey.

Eggs: See the Appendix.

Eg'ham: a village of Surrey, England; on the Thames; 18 miles W. of London and 3 miles S. E. of Windsor (see map of England, ref. 12–I). In the vicinity is the field of Runnymede, where King John and the barons held a conference, which resulted in the signing of Magna Charta in 1215. Here also is the Royal Holloway College for Women, founded by Thomas Holloway, and opened in 1886.

Egilsson, ĕ'gil-sŏn, Sveinbjörn, Dr. Theol.: philologist; b. in Southern Iceland, Feb. 24, 1791. After studying at the University of Copenhagen he took up the profession of teaching. He was rector of the school at Reykjavík from 1846 to 1851, when he retired on a pension. D. Aug. 17, 1852. Egilsson's great work, the *Lexicon poeticum antiquae linguae septentrionalis* (Copenhagen, 1860), a monument of learning, industry, and acuteness, is indispensable to the student of Old Norse. He also had a large share in preparing the Arna-Magnæan edition of Snorri's *Edda* (3 vols., Copenhagen, 1848–87), and his minor contributions to Old Norse philology were numerous and important. A collection of his writings was published at Reykjavík in 1855–56 (*Rit Sveinbjarnar Egilssonar*, 3 vols.). G. L. Kittredge.

Egina: See Ægina.

Eg'inhard, Eginard, or **Ein'hard**: historian; b. about 770 in what is now Hesse-Darmstadt; was a pupil of Alcuin. He gained the confidence of Charlemagne, who appointed him his secretary. He accompanied that emperor in his journeys and military expeditions. After the death of Charlemagne he passed into the service of Louis le Débonnaire. His wife was Imma, who in the twelfth century was confounded with Emma, a daughter of Charlemagne. His chief works are a *Life of Charlemagne* (in Latin; English translation by S. E. Turner, New York, 1880), and *Annals of the French Kings*, German translation by O. Abel (Berlin, 1850); best edition of both in Pertz, *Monumenta Germaniæ Historica*, vols. i. and ii.; there is also a complete Latin and French edition of his works by A. Teulet (2 vols., Paris, 1840–43). D. in Seligenstadt, Mar. 14, 840.

Eglantine [Fr. *églantine*, from deriv. of Lat. *acus*, needle; so called on account of its prickles]: a name of the *Rosa rubiginosa*, a species of rose sometimes called sweetbrier. It is a native of Europe, and is naturalized in the U. S. The flower is single and fragrant. The leaves also emit a peculiar fragrant odor from their russet-colored glands. The plant sometimes grows 8 feet high, and is common in fields and roadsides.

Egleston, Thomas, LL. D.: mineralogist; b. in New York city, Dec. 9, 1832; educated at Yale College and at the School of Mines, Paris, graduating in 1860; in 1861 appointed to take charge of the laboratory and the mineralogical and metallurgical collections of the Smithsonian Institution in Washington, D. C.; in 1863 planned a School of Mines for Columbia College, New York, and in 1864 was made Professor of Mineralogy and Metallurgy in that department. In 1866 he made the geological and agricultural survey of the first 100 miles of the Union Pacific R. R. In 1868 he was appointed U. S. commissioner to examine the fortifications of the U. S.; in 1870, 1878, and 1885, was member of the annual pyx of the U. S. mint; in 1873 was juror at the Vienna Exhibition; in 1890 was decorated with the order of the Legion of Honor of France. He was one of the founders of the American Metrological Society, and of the American Institute of Mining Engineers, of which he was vice-president 1872–74, 1877–78, and 1884–85, and president 1886; vice-president of the New York Academy of Sciences 1869–81. He has taken out numerous patents, and has published a number of works, each of which has passed through several editions, including *Tables for the Determination of Minerals* (New York, 1867); *Metallurgical Tables on Fuels, Iron, and Steel* (1869); *Lectures on Mineralogy* (1871); *Catalogue of Minerals and their Synonyms* (1889); and *Metallurgy of Gold and Silver* (1890). D. Jan. 15, 1900.

Eglinton and Winton, Archibald William Montgomerie, Earl of: a British peer; b. at Palermo, Sicily, Sept. 29, 1812; succeeded the twelfth Earl of Eglinton in 1819. In politics he was a Conservative. He was appointed Lord-Lieutenant of Ireland in 1852 and in 1858. D. Oct. 4, 1861.

Eg'mont, or **Egmond**, Lamoral, Count d'; also known as Prince de Gavre: Flemish nobleman and general; b. at the castle of La Hamaide in Hainault, Belgium, in 1522. He was descended from the Dukes of Gelderland; married Sabina, Duchess of Bavaria, about 1545; served in the armies of Charles V., who created him a Knight of the Golden Fleece in 1546. In 1557 he commanded the cavalry of the Spanish army, and defeated the French at St.-Quentin. He gained a decisive victory at Gravelines in 1558, and acquired much popularity. As an associate of William, Prince of Orange, he opposed the intolerant and despotic policy of Philip II., but constantly adhered to the Catholic Church. He was appointed a member of the council of state in 1559. He ceased to act with the popular party after they revolted against the Spanish king, but the latter regarded him with jealousy and hatred, and sent the Duke of Alva to Flanders with viceregal power in 1567. Alva was a bitter enemy of Egmont, and is said to have brought his death-warrant from Philip. Egmont and Count Horn were arrested, tried for treason, and executed June 5, 1568, at Brussels. This cruel act provoked a general revolt against Philip II. The story of Egmont is the subject of a tragedy by Goethe. See Motley, *Rise of the Dutch Republic* (chap. ii., part 3); Brunelle, *Éloge du Comte Egmont* (1820); and Juste, *Le Comte d'Egmont et le Comte de Hornes* (1862).

Egret [Fr. *aigrette*, dimin. to O. Fr. *hairon*; Ital. *aghirone*, from O. H. G. *heigir*]: any one of several species of small herons which have, during the breeding season, a well developed crest and the back adorned with long, loose, flowing plumes. The most beautiful are the white egrets, whose plumage is throughout of a pure white. Two species, *Ardea alba* and *A. nivea*, are found in Europe, and two very similar species, *Ardea egretta* and *A. candidissima*, are found in the warmer parts of America. The plumes of these birds are in great demand, and in many localities where egrets were formerly abundant they have been practically exterminated as a consequence of the demand.

F. A. Lucas.

Egripo, or **Egripos**: a town of Greece. See Chalcis.

Egypt [native *Qem-t*, black, referring to the soil; Coptic, KHME, of the same signification; Heb. *Mizraim*, or *Mazor*; Assyr. *Mi-is-ri-i*, shortened to *Misri*, *Misr*; Arab. *Masr*; Gr. Αἴγυπτος; Lat. *Ægyptus*; Turk. *Gipt*; Ital. *Egitto*; Fr. *Égypte*; Germ. *Ägypten*. *Egypt* comes through the Greek name Αἴγυπτος, which is of uncertain origin]: a country in the northeast part of Africa; bounded on the N. by the Mediterranean Sea, on the E. by the Red Sea, on the S. by Nubia, and on the W. by the Great Desert. It extends from lat. 24° 3′ to 31° 36′ N., its northen and southern limits being respectively the mouth of the Nile and the first cataract at Assuân. In *size* Egypt, exclusive of the desert, is of about the area of Belgium, 11,342 sq. miles. Though 550 miles long, it is exceedingly narrow, only measuring from 4 to 16 miles in width, except in the Delta, which spreads out broad and low. In ancient times the arable area was probably smaller than now; certainly the Delta region was mainly devoted to pasturage. Ancient tomb-sculptures show considerable unavailable tracts where nobles hunted water-fowl. On the other hand the portions farthest from the river are now almost useless on account of the failure of high Nile to reach them even when artificially aided.

Herodotus called Egypt the "gift of the Nile," but it is more. It is the creation of the river, and the river is its preserver. The land occupies the cañon which the water has made, and its annual renewal is due to the fertilizing matter which the inundation brings down. The valley is flanked not by mountains, but by bluffs, which mark the original level. The Delta has been raised above the sea-level in the course of ages by the same means, but it is still so low that the removal of a few inches of soil renders the

land sterile. The only variety offered to the eye is that of ancient city mounds and the low embankments which serve as dams against the Nile floods. Toward the N. E. the level is said to be gradually sinking (see MENZALEH), while at Suez a rising has occurred within historic times. It is almost certain that the Red Sea has receded from its former limits, which must have included the Bitter Lakes and Lake Timsah. See EXODUS.

ANCIENT EGYPT.*

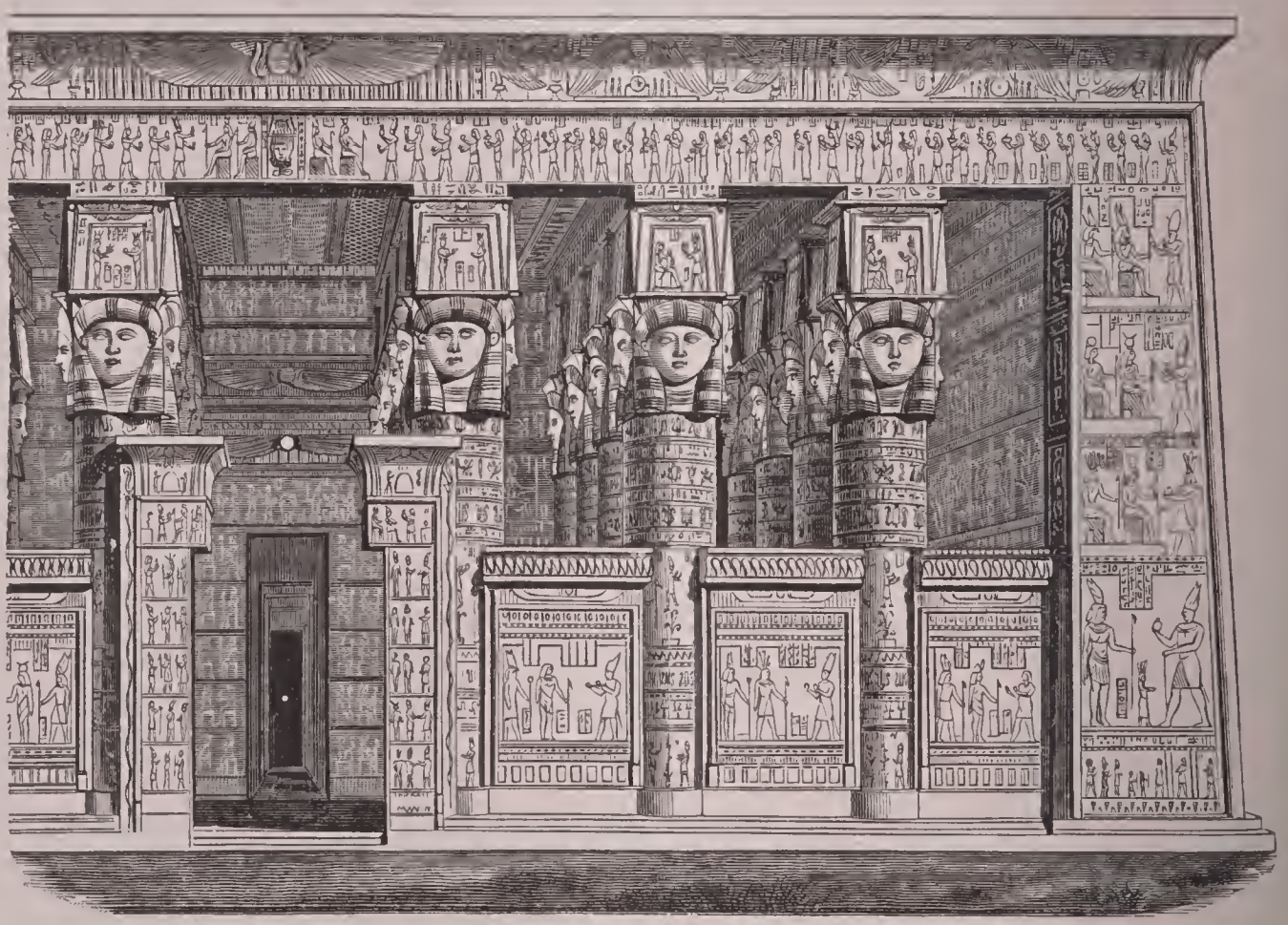
Divisions.—The division of Egypt into Upper and Lower is prehistoric, and the usual royal title "king of the two lands" (dual) points to an original independence, whose termination tradition ascribes to Menes, the first king. Upper Egypt always had precedence and was mentioned first in the royal nomenclature. It was known as *Ta-res*, or with the article *Pa-ta-res*, "the south land," the PATHROS (*q. v.*) of the Hebrews. The Delta was *Ta-meh*, "north land," the Mazor of the Hebrews. For administrative reasons the Ptolemies and Romans made a third district, Middle Egypt.

Nomoi.—In the geographical lists from the times of Thothmes III. (eighteenth dynasty) and his successors, smaller divisions are noted, twenty-two in Upper and twenty in Lower Egypt (the numbers are not always the same). These districts, called nomoi by the Greeks, had each its own particular deity or deities, worship, festivals, and sacred animals.

Although Diodorus (i., 54) ascribes the nomos-division to Sesoosis (SESOSTRIS, *q. v.*; Ramses II., nineteenth dynasty), that of Upper Egypt is supposed to have antedated the establishment of the kingdom, and that of Lower Egypt to have been arranged merely by way of imitation. The particular names of these subdivisions had reference to the deity worshiped, the chief city, local characteristics, or geographical position; Greek designations were based on the first two grounds. Complete lists are to be found in any good history of the land.

Boundaries.—The natural southern boundary was near Assouan at the first cataract, though under Usertasen III. (twelfth dynasty) it was pushed forward to Semneh, just beyond the second cataract (in order to gain control of the mines of Nubia), and later still under Thothmes I. the conquest was continued to the third cataract, and by Thothmes III. to the Sudan. At Syene was a place of barter with the Nubians and the blacks of the south, and from one of the principal articles (ivory) of this trade the island of *Abu*, Elephantiné, got its name. At Semneh a stele was erected by Usertasen III. forbidding the northward passage of foreigners in other than Egyptian boats. At Abu-Simbel (see IPSAMBUL) Ramses II. executed two wonderful rock-hewn temples. Across the isthmus of Suez, marking the northeastern frontier, there extended during a part of Egyptian history a line of fortifications protecting all avenues of approach, to which the name "wall of the prince" was applied. It was by no means a continuous structure. An unpublished papyrus at St. Petersburg ascribes its construction to Snofru of the fourth dynasty (see below), and a papyrus of the twelfth dynasty, at Berlin, recounts the difficulty which a fugitive Egyptian had in passing the sentries set to watch against marauders.

Cities.—The cities of Egypt rank according to a double standard—religious and political. Each nomos had its chief city, its principal deity and cult. The principal places in Upper Egypt were the following: Syene, *Sun*, a strategic point on the southern frontier; Elephantiné, *Abu*, a place of trade; Ombos, *Nubi*, devoted to the peculiar dual worship of Sebek and Horus; Silsilis, *Chenu*, with valuable quarries; Edfu, *Teb*, devoted to Horus and an important place in Egyptian mythology; Esneh, *Sen*, Latopolis, the religious capital of the third nomos; Elkab, *Nechent*, Eileithyia, a place of pilgrimage, devoted to Nechabt, the protecting goddess of the south; Erment, *On*, Hermonthis, the forerunner of Thebes, *Us*, *Nu*, *Nu-Amon*, Heb. No-Amon, the most powerful city of Egypt, though neither the most ancient nor most sacred; Koptos, *Qobti*, devoted to *Min*, the Greek Pan, a place of importance in the Red Sea trade (since the caravan route started thence for Koser), and valuable for its quarries of hard dark stone; *Chemmis*, Panopolis, modern Akhmim, was devoted to the same deity; Denderah in the sixth nomos was an important religious center, devoted to Hathor, and contained a temple whose foundation is ascribed to the earliest times; Abydos (see MEMNONIUM), the most holy place in Egypt on account of its tomb of Osiris; Thinis, *Ten*, the native place of Menes, the first king; Kau el-Kebir, *Du Qau*, Antæopolis, the capital of the twelfth nomos; Siut, *Saut*, Lycopolis, devoted to Anubis, seat of the mighty dynasties of the Middle Kingdom, and possessed of tombs whose portrayal of contemporary life is beyond value; *Chmunu*, modern Aschmunen, Greek Hermopolis, an important religious center; Tell el-Amarna, the city of the heretical King Amenophis IV., the place where many cuneiform tablets were discovered in 1887; Beni Hasan (see HASAN), in the sixteenth nomos, containing tombs from the twelfth dynasty, and the SPEOS ARTEMIDOS (*q. v.*); Ahnes, *Chenensu*, Heracleopolis, of great importance on account of its mythological connections; and the FAYUM (*q. v.*) belonging to the twentieth nomos. The sites of these



Temple of Denderah.

* "Ancient" Egypt here designates the entire period which closed with the Ptolemies in 30 B. C., including the Old Kingdom (Dynasties I.–VI.), the Middle Kingdom (XII.–XIII.), the New Kingdom (XVIII.–XX.), the Tanite, Bubastite, and Saite dynasties (XXI.–XXIV.), the Ethiopian domination (XXV.), the second Saite (XXVI.), the Persian (XXVII.), contemporary in part with the third Saite, the Mendesian and Sebennyte (XXVIII.–XXX.), and finally the Ptolemaic period, 324–30 B. C.

EGYPT

SCALE OF MILES
0 50 100 150 200

Railroad — Suez Canal —

30 35 40

MEDITERRANEAN SEA
Rosetta
Damietta
ALEXANDRIA
Aboukir
Port Said
Tamiah
Zagazig
El Arish
Gaza
PALESTINE
Jerusalem
Dead Sea
LOWER EGYPT
(MASR EL-BAHRI)
Ismailia
Gulf of Suez
Bulak or Boulac
CAIRO
Ghizeh or Gizeh
Suez
Isthmus of Suez
Pyramids
Medinet-el-Fayum
Beni-Souef
Feshn
Behnesa
Aboo Girgeh
Nile R.
SINAI PENIN.
Akabah
Gulf of Suez
Mt.Sinai
G. of Akabah
Minieh
Sooadee
Khareeb Mt.
Roda
Melawee el Arish
Beni-Hassan
Moilch
Djara
Manfaloot
Aboo Shaan
Zebald
Asslut
Tahta
Soohago
Girgeh
Abydos
Keneh
Kosseir
El Wojeh
Oasis Dakhel
Denderah
Luxor
Karnak
Mt.Aboo-Tir
Ruins of Thebes
Akra
Asfoon
Esneh
El Kab
Merza Mobarak
Oasis el Khargeh
El Haura
Edfu or Edfou
Bedesreh
Nooker
Nabt Kheyf
Oasis Koorkoor
Mt.Zebara
Darawi
MEDINA
ELEPHANTINE I.
Assouan
1st Cataract
Ruins of Syene
Ruins of Berenice
Rass Benmass
Jemb or Yambu
El Kalabsheik
Darmoot
TROPIC OF CANCER
Doangan
Alfaha
Maharragah
Ipsambul or Abu-Simbel
Sebwa
Mt.Gerfe
SEAL I.
Aboo Tingil
Korosko
Ibrim
UPPER EGYPT
Mt.Elba
C.Elba
2nd or Great Cataract
Wadi-Halfa
(EL SAID)
Mt. Sotoorba
Jeddah or Jiddah
MECCA
Semneh
Oasis Selimeh
Mt.Reft
Mt.Sahaunit
NUBIAN DESERT
Mt.Irwa
MACOWA I.
Dal
Saquiet el Abd
Amarah
El Buida Sadie
Soleb
Kojeh
Tinareh
Mt.Honib
Mt.Gabkava
El Shadsha
Kaina
Korkeh
Doorkod
Mt. Adrawebb
Mt.Shika
3rd Cataract
Hafir
Abu-Hamed
Bir es Nawarik
Hannik
El Ordeh
Aboo Kashim
Mt.Badab
New Dongola
Hanmak
4th Cataract
SUAKIM or SAWAKIN
El Kef
NUBIA
Assanaga
El Gojah
Handak
Old Dongola
(Dongola Angusa)
Aboo Egli
El Bakarah
5th Cataract
Trinkitat
Konfodah
Ed el Kaab
El Dabbcho
Korti
Tokar
R.
El Genet
Khisah
PROPOSED
Ambukol
Berber
Mt.Langheb
C.Kasar
Eidarbeh
Ed Elaco
El Damer
Ruins of Meroe
Asarat
Bir Abo
Mt.Umgooboor
Wald-gan
Goomer
FARSAN IS.
Ain
El Koordi
El Metammeh
Shendi
Nakfa
DAHLAK ARCHIPELAGO
Tamania
6th Cataract
Fillik
Bir-el Serrir
Omdurman
Halfaia
Khartum
Kassala
Loheia
Es Sahfi
Kobi
Gelid
ISLE OF MEROE
Asmara
Saate
Massowah
Kailoob
Hodeida
Merutta
Sajala
Katsch
Kaimar
Mesa-lemieh
Abu Haras
Tomat
Adigrat
EGYPTIAN SUDAN
Axum or Axoom
Adowa
Ed
Bara
Sennaar
Mocha
KORDOFAN
El Obeid
Baha
Karkog
Antalo
Assab
Perim
Matama
Gondar
Abu Harras
Takoba
Hedebaf
L.Tana or Dembea
Kadero
Werkat
Obock
Djuku
Buseres
Korata
Magdala
Bay of Tajura
Burun
Ismata
Famaka
Belia
Zeila
Tira manai
ABYSSINIA
Beni Schongul
Kaka
Gamascha
Tana
Agoldi
Blue Nile
Fashoda
Ankobar
Bahr el Arab
Kobbo
Harrar
Sobat

30 Longitude East 35 from Greenwich 40

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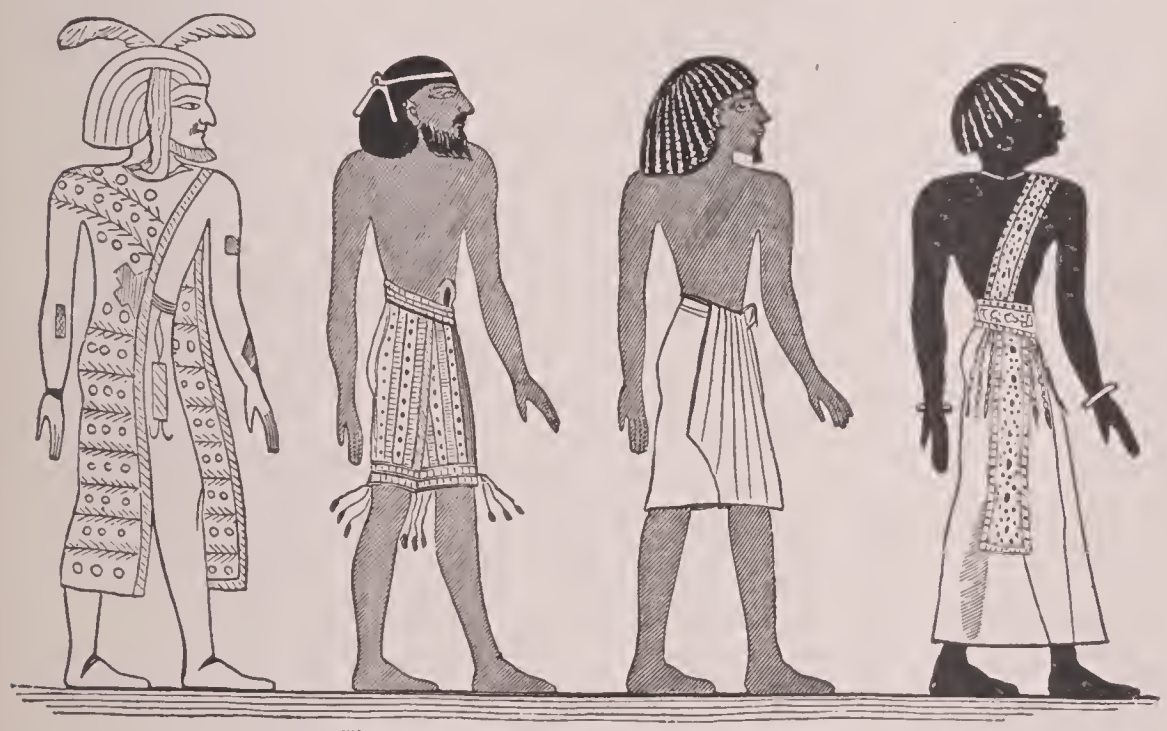
places are well identified, but the same is not true of many of the large cities of the Delta. Worthy of mention are Memphis, *Men-nofer*, the capital chosen by Menes in uniting the "two lands"; *On*, Heliopolis, Hebrew Beth-Shemesh, the most learned city of the land, and next to Abydos in sanctity; Sais, *Sau*, the seat of the Libyan rulers, and the resort of Greek scholars; Sebennytus, the seat of the thirtieth dynasty, and the reputed birthplace of the historian Manetho; Mendes, *Ded*, and Busiris, localities important in the Osiris-myth; Bubastis, *Pa-Bast*, Hebrew Pi-Beseth (*q. v.*), a city of great antiquity, and a seat of the Hyksos kings; Tanis, *Tsan*, Heb. Zoan, one of the most important cities in Egyptian history; Avaris, supposed to be Pelusium (*q. v.*), the last Hyksos stronghold; Zar, a border fortress; and Pithom, *Pa-Tum*, Succoth, Heroöpolis, one of the cities built by the Israelites for Ramses II.

Foreign Relations.—During a very long period of history the Egyptians were isolated. Barter with the south was practiced from time immemorial, and a trade in oils and woods was carried on with traveling merchants from the north and east, but both were consummated on Egyptian soil until a comparatively late period. The twelfth dynasty saw extended relations toward the south, and the pursuit of the Hyksos at the beginning of the eighteenth opened new connections with the north. The notable expedition under Queen Hatasu (*q. v.*) to Punt (see Somali Coast) for incense and other desirable objects was a public venture. In the new kingdom trade was carried on privately in the east, but the Government also had its own ships which visited the coast countries. Multitudes of things were imported, and many retained their foreign names, probably a mutual operation. Strange to say, the eastern wars gave this impulse to trade, and their records have revealed much of the geography of the times. Of the lands traversed Palestine included the "Upper" and "Lower" *Retenu*, or "Canaan," and the land of the Amorites; Phœnicia was *Keft*, and its inhabitants *Fenech*; Syria was *Naharan*, and extended to the Euphrates, which is described as that "reversed water, on which one journeys northward upstream." Assyria was probably not trodden to any extent, and Babylonia was a *terra incognita*. Hundreds of Syrian places are mentioned whose sites are unknown. In Palestine there were many tribes, each with its strong place, but Syria alone offered the resistance of powerful national might. To some extent the Egyptians had knowledge of the peoples of Asia Minor, and of the islands, especially Cyprus. (See W. Max Müller, *Asien und Europa*, Leipzig, 1893.) After the eighteenth dynasty there was a heavy Semitic immigration into the Delta, and the mixing of races was much promoted by the multitudes of slaves taken in war. The same effects came from the employment of Libyan and finally of Greek mercenaries in the later periods, only with results more fatal to the integrity of the state.



The four races of the Egyptian monuments.

People.—The origin of the Egyptians is unknown. Ethnologists have endeavored to establish a relationship with the peoples of the south, any differences being accounted for by variations of environment. Philologists have looked to the east for their next of kin as regards descent as well as speech. It has also been thought by some that an eastern origin is indicated by the fact that the Egyptian oriented himself by looking toward the south, but this is rather due to the direction of the Nile. Between the results thus reached there is an evident conflict, with no obvious means of harmonizing them. It has been suggested that the facts can best be reconciled upon the theory, not of a migration of a whole people, but of an incursion of a smaller band who succeeded in establishing their rule over the original people and in gradually forcing their own language, as that of a ruling class, upon those whom they had subjugated, while still the ancient ethnological type persisted. This theory is merely a working hypothesis, and it has reference to a time long anterior to any historical monuments or traditions, for long before the earliest extant inscription Egypt was a united country under the rule of native kings, and possessed of a well and independently developed government and of well-defined classes of society.

Names.—A national name for the people as such never seems to have existed. Among themselves they were *romet*, men, *par excellence*; all others were inferior races, "miserable" Cushites, Libyans, Asiatics, *Shasu*. They themselves were the wards of the great gods, and Pharaoh was descended from Ra, who had himself once ruled in Egypt. Other peoples were descended from the enemies of their deities, and when Ra had overthrown them at Edfu a portion escaped; those southward became Ethiopians, northward Asiatics, westward Libyans, eastward Beduin.

Character.—Personal experience has warped the judgment of observers on this point. Herodotus praises the cleverness of the Egyptians and their excellence of memory; Diodorus declares them to be the most grateful of people; the Emperor Hadrian characterizes them as "thoroughly frivolous, unstable, following every rumor, refractory, idle, and libelous." The modern notion is that they were so occupied with the thoughts of the future as to be oblivious to the present. There is undoubtedly a degree of truth in all of these estimates, but a broader survey shows that they were energetic in their undertakings, as is evidenced by their temples and the pyramids, still the wonder of the world; possessed of sufficient skill to perform by force of numbers labors which would test modern mechanics severely; practical in their methods of utilizing the forces of nature; peaceable as over against other nations, and little given to love of novelty; artistic in their execution and accurate in their observation; a people given to realism; unversed in literary arts; devoted to agricultural pursuits; developed within narrow limits, and little affected by external and foreign influences.

Classes.—The monuments are fuller than the enumerations of Herodotus and Diodorus, who name seven and five classes respectively. Herodotus (ii., 164) gives priests, warriors, cow-herds, swine-herds, tradesmen, interpreters, and boatmen; Diodorus (i., 74), priests, warriors, husbandmen, shepherds, and artisans. All these existed, but the enumeration is defective. True caste was unknown. The population was divided into two great parts—nobles and slaves—while the middle class has left its traces from the Middle Kingdom onward. The upper class included royalty and those in the service of state or religion, a ruling class, far removed from the slave population, foreign and native. They formed the backbone of the state, filled all the higher offices, and were obeyed by all their social inferiors. At the head of the government stood Pharaoh (*q. v.*; Egyptian, *Per-aa*, great house), "King of Upper and Lower Egypt, son of Ra, eternal." Ramses II. is bombastically called

"Horus, the mighty bull, beloved of the goddess of truth, lord of the 'vulture and serpent' diadems, protector of Egypt, subduer of the barbarians, the golden Horus, rich in years, great in victory, King of Upper and Lower Egypt, 'Ra strong in truth, chosen of Ra,' son of Ra, Ramses beloved of Ra." Similarly the queen is called "the consort of the god, mother of the god, the great consort of the king"—god and king being interchangeable terms. She was usually of royal blood, often own sister of the king, his equal in birth and place—"Mistress of the House." Crown prince and princes came next in order. The upper classes consisted of "the nearest friend" of the king, and friends of various grades, generals, high priests, officers, physicians, overseers, district chiefs, presiding judges, keepers of the seal, master builders, treasurers, fan-bearers, scribes, and many others. Officialdom ramified in numberless class gradations, whether the order was priestly, military, literary, architectural, mechanical, or agricultural. Advancement went by royal or other favor. (See Brugsch, *Ägyptologie*, p. 212 ff.) The middle class of the kingdom remained in the background, and is less known because its members could not, like the kings and nobles, erect those enduring tombs from which knowledge of the times is obtained. After the removal of the necropolis from Memphis to Abydos during the period of the Middle Kingdom, and owing to the growth of the practice of erecting memorial stelæ, the monuments of untitled persons begin to appear, giving a conception of their number and position. They possessed households similar to those of officials, and in many ways appear to have been their equals. They were merchants, traders, artisans, free workmen, weavers, potters, carpenters, joiners, smiths, etc. The lowest class was composed of the slaves, native or taken in war, who were hewers of wood and drawers of water, performing all menial offices. They were mere chattels, belonging to temple, necropolis, or landed estate, and were often organized as a part of the military establishment. Closely allied to them were the shepherds, the pariahs of Egyptian society.

Employments.—Each administrative department had its own "troop" of laborers under its own overseer, who kept minute tally of work performed, rations distributed, and of absentees. The troop, not the individual, was the unit. All artisans as well as the slaves were regarded superciliously by the scribes and held in lower repute than the agriculturists, though the products of their skill still command admiration. Weavers, working with papyrus reeds or with linen thread, produced baskets, mats, boats, or the finest linen cloths; joiners, though handicapped by lack of good raw material, nevertheless produced creditable work by the use of instruments most simple in their character. Potters through all periods reproduced patterns tenaciously and with little variation, but atoned for the rudeness of much of their work by the fineness of their products in faïence, the glazing of stone objects being specially noteworthy. Metal workers used gold, silver, bronze, iron, and tin, the source whence tin was derived being problematical. A bronze is mentioned which was an alloy of six metals. Objects in bronze and iron have been found among the remains of the Old Kingdom, though the earliest bronze statue is one of Ramses II. The sources of most metals were the mines of Nubia and Sinai. In value silver exceeded gold, and a mixture of the two is frequently mentioned. The processes of agriculture are well portrayed on the walls of the tombs. The plow was simply a sharpened stick dragged through the ground by oxen; the hoe a broad blade fastened to a handle, a second cord midway of each preventing too great a strain. The seed once scattered was trampled in by animals. Harvesting was done by a short sickle; the grain was carried in sheaves to the threshing-floor, where the hoofs of cattle performed the required labor. Winnowing was done with shovel and wind, and the grain was stored in conical receptacles open at the top, to which the bearers mounted on ladders. Supplementary irrigation was by a well-sweep similar to the modern *shaduf*. These labors were so essential a part of Egyptian life that the future life was portrayed under exactly the same circumstances, happiness consisting essentially in the degree in which personal performance could be avoided. Cattle of all sorts, asses, sheep, pigs, and goats existed in immense herds, and were tended by slaves and peasants whose occupations and lives in marshy districts so far removed them from civilization that they were regarded with detestation (Gen. xlvi. 34). Their disrepute is the more remarkable in view of the evident pride with which landed proprietors enumerated their flocks.

Education.—The school, "book-house" or "house of instruction," presided over by a scribe, was an institution of the Old Kingdom, which received all classes alike, and prepared them for the technical education of the special bureau. In the New Kingdom both branches were combined in departmental schools. Orthography, calligraphy, style, and the formulæ of etiquette comprised the known curriculum; the rest was learned by practice. Many corrected school exercises have survived containing various specimens of literature; tales, religious and magical texts, poems, codes of rules, or "instruction" of ancient sages for the proper regulation of daily life, and *ex-parte* statements of the unlovely condition of soldiers and laborers as contrasted with the beauty of the scribe's life, at once inciting to industry on the part of the pupil, and to profound respect for the teacher. These papyri are of great value in affording knowledge of orthography, language, and literature.

Landed Property.—The tombs of the Old and Middle Kingdoms represent the various operations of large landed estates in all their complexity. Such private ownership of the soil, of large tracts, and even of whole villages, seems to have been a survival from the time when the princes of the nomoi were at the head of the independent districts which collectively constituted Egypt. A decided change is seen in the New Kingdom when the title to all land except that attached to the temples was vested in the king, and when it was worked for the state by slaves or let out at an annual rate per cent. The change came about during the Hyksos period or in the transition to the revived native dynasties. The biblical account of Joseph is of interest in connection with this.

Houses.—The dwellings of the common people probably resembled those of the fellahin of to-day, being mud hovels whose destruction accounts for the formation of the tells which mark city sites. The dwellings of nobles and kings were more pretentious, but no remains have survived. The only models by which to judge are some ancient sarcophagi of house-like form, and some mural representations. Record has survived of a palace which stood 300 cubits square.

Family.—The position occupied by woman was quite extraordinary. In the household there was usually only one *wife*, though there might be several concubines or female slaves. Actual polygamy was infrequent, though the royal harem often contained 200 women. Private persons also maintained harems, the number of inmates depending on the financial ability of the individual. Inheritance and genealogy were reckoned by the mother, not the father, and while a man's possessions might descend to his sons, the line might also pass through the daughter to her sons. Sometimes marriages were contracted upon these considerations. It was a father's ambition to hand down his official position to his sons, and the title of "hereditary prince" is often found. The practice of marriage with a sister is met in early periods, but under the Ptolemies it was quite the rule, and the marriage contracts specified the amounts which the husband engaged to give annually to his wife for family purposes.

Costume.—There is a constant development observable in the dress of the upper classes. Royalty set the fashions, and they were followed at intervals by those standing on the various social levels. There was a distinction between king and noble and between noble and plebeian. The simple apron bound about the loins was always the essential garment. To this the king added a lion's tail and the noble a panther's skin during the period of the Old Kingdom. In that of the Middle Kingdom the apron took a pointed triangular shape in front and became longer. Next comes a double apron, a short one beneath, opaque, and a long and transparent one outside. The priest continued to wear the short apron, however, while the king had advanced to a mode of dress which covered the whole body, and was complex in arrangement and structure. That which before was holiday attire became the garb of every day. The dress of women was more uniform. It consisted at first of a close-fitting garment which extended from the breasts to the ankles, and was fastened by straps over the shoulders. Only in the latest periods were sleeved or sleeveless mantles worn. Transparent cloth was used for female wear, as for the outer apron of males, but without the inner garment. The dress of peasants consisted simply of the apron, which in some cases amounted only to a band with pendant ends. These simple articles were made of papyrus mats, leather or cloth. The hair was worn short, but the shaving of the head does not appear to have been practiced daily. Wigs of various

forms and sizes were used as ceremonial head-coverings. Specimens of them are not infrequent. Natural beards were not worn except by shepherds and similar persons, but an artificial "imperial" beard was one of the marks of royalty and divinity in the tomb representations. Sandals of various sorts completed the costume.

Recreations.—The hunting of wild animals was by coursing with dogs and the use of lasso and spear. The bow and arrow were seldom employed. Fishing was with line or net. Fowling was done in the marshy districts in boats, the weapon used being the boomerang. Traps and nets were also employed. Wrestling-matches and gymnastic exercises, ball-playing and juggling, are often represented in paintings. Singing and music were the accompaniment of work and play, and at feasts music and dancing, performed by members of the harem, enlivened the scene. The instruments used were the flute and a sort of whistle, the guitar, the harp, and lyre, the last two having sometimes nearly twenty strings. Assistants beat time by hand-clapping. Bow practice was engaged in and a game similar to quoits is represented, along with other games which can not be understood in their details. T-shaped boards, divided into squares like checker-boards, have been found, but how they were used is uncertain. The children were not forgotten, for the tombs have yielded specimens of their toys.

Government.—When the king was simply the first among equals, Upper Egypt was divided into thirty administrative departments of different grades, each having its nomarch or governor who stood as the leader in everything—chief judge, district chief, military commander, tax collector, architect, treasurer, etc. As judge he was also the priest of MAT (*q. v.*), the goddess of truth. So long as the king retained supreme power this arrangement continued, but upon the decay of royal prestige each district chief aspired to leadership. This probably explains the periods of confusion in the history indicated by the blanks between the seventh to eleventh and thirteenth to seventeenth dynasties. A new order came in during the period of the New Kingdom. The nomarch surrendered all his functions to the military official appointed by the king to look after his interests and to gather the taxes in kind, peaceably or forcibly as the case might be. Royal stewards and messengers, the "mouths" or "speakers" of the king appear as intermediaries. Some of the more important additional offices were those of chief judge, governor, building-master, treasurer, overseer of granaries, etc. (see above: *Classes*). The chief judge was a man of high standing, a prince or noble, or perhaps a priest. Beneath him were several grades in the office. Several sat as a court, and before them complaint was made, prosecution and defense heard, and judgment pronounced or referred to the king, according to the gravity of the complaint. The prosecutor might be a private person or a public official with whom the complaint was lodged. Confessions were forced with the bastinado. The severest punishments were the loss of ears and nose, or death by impaling, compulsory suicide, or poisoning. Accounts of trials are frequent, but no legal code has survived.

Military.—In the earliest periods there was no standing army, because of the nature of the people and of the peculiar organization of the kingdom. Each nomos had its own militia and each temple its soldiers, who appear rather to have been police. This arrangement continued through the Middle Kingdom. The chief service rendered by the soldiers in these periods was to escort expeditions to the quarries of SYENE and HAMMAMAT (*q. v.*), and to the mines of Sinai and Nubia. They also rendered service as laborers. The most important military expedition undertaken in the Old Kingdom was that of Pepi (sixth dynasty) against the Beduin of the east. The army consisted largely of Ethiopian mercenaries under Una, a judge-general, but it required five expeditions to reduce the "people dwelling on the sand" to subjection. (See *Records of the Past*, ser. 2, vol. ii., p. 1 ff.) This use of mercenaries characterized the whole of Egyptian history. The expeditions of Amenemha III. (twelfth dynasty) to Nubia mark the next stage of foreign warlike operations. A stele of this period in Berlin mentions the wailing which attended the visits of the conscripting officer, the "military scribe" who came "to choose out the likely youth." A new feature of the period is in the body-guard which surrounded the king, a sign of a more developed royalty. The long contest with the Hyksos educated the warlike spirit of Egypt, at least so far as the upper classes were concerned. The armies, however, appear to have been composed of mercenaries in the main, while conscription was little employed. This practice became more and more fixed in later times. A body of troops employed during the nineteenth dynasty contained 1,900 natives and 3,100 foreigners. At first the foreigners were officered by Egyptians. A principal service required of the soldiery was police duty as gendarmes. *Madai* was the special name of the bowmen in the Old Kingdom, and they seem to have been foreigners. In the New Kingdom this name became the ordinary designation of "soldiers." They had their own generals and they played an increasingly important *rôle*. The chariot came into use at or after the Hyksos wars, and was constructed to contain two persons, driver and warrior. Border garrisons were maintained to the east and south. The ancient insignia of the warrior were two feathers on the head, a mark supposed to have been of foreign origin and used to denote foreign troops. The bow was also foreign, and held in lower esteem than the native weapons—the spear and shield, the ax, lance, dagger, and sling. The earliest clothing of the soldier consisted of the simple apron, and was only slowly replaced by the helmet and wadded garments. Naval warfare was little practiced, though it was necessary against the Hyksos on the Nile, and again later against "the inhabitants of the islands," whom Ramses III. drove back from the Nile mouths. Military scenes are reproduced in Rosellini, *Monumenti dell'Egitto: Mon. Storici*; in Lepsius's *Denkmäler aus Ägypten*; in Wilkinson, *Ancient Egyptians*; Meyer, *Geschichte des alten Ägyptens*; and in Erman, *Ägypten*. The details of these scenes are of very great interest historically and as art.

Religion.—No satisfactory treatment of this subject has appeared, though it was one of the first to awaken interest. The names of the deities of the pantheon are well known and their general characteristics are sufficiently defined, but the gradations between them and the conceptions which gave them force are obscured, not only by the most curious inconsistencies, but by the fog of a mythology which is for the most part unknown to us. Religious conceptions existed during all periods, but never a religion in any true sense. It is plain enough that the differences in religious belief and practice corresponded to the primitive condition of the land, each district having its chief object of veneration. It was a condition of HENOTHEISM (*q. v.*) out of which, in consequence of the closer contact produced by the union of the nomoi under a central government, there grew up a system of national polytheism, in which the principal god of the capital gained pre-eminence. The original deities were objects of nature, but their development was various in the different nomoi. Only at a later date did gods appear who represented abstract or cosmogonical ideas. When intimate association occurred there was a resultant confusion of attributes and names. The hegemony of the god of the capital contained in itself the motives of monotheism, but there is no indication that monotheism was the original form of the Egyptian religion or that the people ever advanced to it, in spite of such phrases as "the only god," and the like. When carefully examined these expressions are found to refer to the deity held in special reverence in a particular locality, the "city god" or the leader of the local triad or ennead. Endowed temples and independent priests of separate deities prove that a determined resistance was made to any attempt to introduce monotheism, such as is actually seen in the case of Amenophis IV. See KHUNATEN and RELIGION, COMPARATIVE.

Local Gods.—Ptah was the god of Memphis; Neith, the warlike goddess of Libyan Sais; Khnumu (Chnum) of Elephantiné was the deity of the cataract regions; while Nechebt was the protecting goddess of the south in general. Min (Greek, Pan) was the desert god. Osiris of Abydos supplanted the earlier deity. Amon of Thebes, Anubis of Lycopolis, Tum (Atum) "Lord of Heliopolis," Bast of Bubastis, Sebek of the Fayum, Hathor of Denderah, Horus of Edfu, Thoth of Hermopolis, Mont of Hermonthis—these suffice as examples of deities which enjoyed special local homage.

Animal Forms.—The forms which many of the deities assume are grotesque in the extreme. It may be a human or animal shape, but more frequently it is a mixture of the two, the human trunk being surmounted by an animal head. Thus Ptah appears as the Apis-Bull, Hapi, Amon, and Khnumu (Chnum) as rams, Sebek as a crocodile-headed man, Nechebt as a serpent, Mut as a vulture, Anubis as a jackal-headed man, Bast as a cat-headed woman, Sechmet and Tefnut as lion-headed, Hathor as a cow, Horus as a hawk, or a hawk-headed man, Thoth as an ibis. The Phœ-

nix is possibly derived from *Benu* of Heliopolis, which appears as a heron.

Gods of Nature.—In various periods of the history certain deities appear as deifications of the powers of nature: Ra, the sun, the ruler of the world, having his sanctuary at Heliopolis, was even in prehistoric times conceived as a person; Horus, the bringer of light, is represented in conflict with Set, the god of darkness; Ra-Harmachis was the rising sun, Ra-Tum the sun at evening. Thoth was also worshiped as the moon.

The number of *mythological beings*, such as Nun the original ocean, out of which Ra proceeded, is beyond number. Mat, the goddess of truth, represents a large class which symbolized *abstract* notions. Deities are also portrayed in *pairs*, such as Qeb, god of earth, and Nut, goddess of heaven, Shu and Tefnut, Osiris and Isis, Set-Typhon and Nephthys. In these pairs is seen also the *family relation* which is carried out in numerous ways, not without great confusion. Hathor, Isis, Nephthys, and Nut were daughters of Ra. Horus and Set were sons of Isis. Tum was begotten of Nu, the water-goddess. Imhotep (Greek, Esculapius), the Egyptian god of medicine, was son of Sechmet, who was skilled in the same knowledge. *Combinations* are very frequent in the later periods, though that of Ra-Tum is most ancient. Ra-Harmachis has been mentioned, Hor-Nub was the "golden Horus" representing the rising sun. Amon-Ra, Ptah-Sokar-Osiris are further examples. *Triads*, consisting of father, mother, and son, were numerous: such as Amon, Mut, and Khonsu (or Chonsu), of Thebes; Ptah, Seehmet, and Imhotep, of Memphis; Sebek, Hathor, and Khonsu (or Chonsu), of Ombos. The ennead was theoretically a triple triad, though frequently the number fell short, in which case it was regarded simply as a divine court patterned after that of Pharaoh. As *symbols* of deities two may be mentioned, the obelisk of Ra and Horus, and the scarab of the abstract deity, Kheper. For particulars concerning these deities, see separate articles.

Future Life.—Much of the religion has its explanation only in connection with the future life. (See Metempsychosis.) When the soul or "double" (see Ka) left the body, the latter was preserved with extreme care (see Mummy) and deposited in a secure tomb (see Mastaba), for the personal existence of the disembodied spirit depended upon the absolute preservation of the mummy. The future of the individual was determined by a judgment which is represented as a weighing of the heart by Horus, who counterbalances it with the symbol of the truth. Mat, the god of truth, watches the operation, and Thoth, scribe of the gods, registers the result. The Hall of Justice and the forty-two "assessors" play also an important part, though the whole is too complicated to be rehearsed here. See Ritual of the Dead.

Mythology.—In the earliest periods specific beliefs as to their nature, qualities, and powers, clustered about the individual deities, but these did not become a true mythology till the amalgamation of variant views under the influence of the national union of the nomoi. The confusion which resulted would naturally lead to attempts at harmony, and thence grew up myths whose office was reconciliation. But, as intimated above, little is known of the mass of this mythology. Its extent must have been great if one may judge by the allusions, such as "Isis in the marsh" and "Horus, avenger of his father," which abound in every religious text. A study and compilation of the entire material is an essential to a scientific study of the religion, but as yet no collection has been attempted.

The myths that are best known are the account of the destruction of mankind—Brugsch, *Die neue Weltordnung nach Vernichtung des sündigen Menschengeschlechtes* (Berlin, 1881); Lefébure, *Tombeau de Seti I.*; *Tombeau de Ramses III.*; *Destruction des hommes*; Naville, *Transactions of the Society of Biblical Archæology*, iv., p. 1 ff., viii., 412 ff.; Wiedemann, *Religion*, p. 32 ff. The myth of Ra and Isis—Wiedemann, *Religion*, p. 29 ff.; Erman, *Ägypten*, p. 359 ff. The myth of Horus—Naville, *Mythe d'Horus*; Wiedemann, *Religion*, p. 38 ff. The myth of Isis and Osiris and of the conflict of Horus and Set as preserved by Plutarch, *Morals*, pp. 1–71 (Bohn edition), is of great interest.

Chronology.—It is difficult to construct for Egypt what the Egyptians never made for themselves. No trace of the use of a fixed era has been found. Time was reckoned in the years of the reigning sovereign, and with each the numbering began afresh. But even this method is only partially carried out. Annals in the sense in which they were recorded by the Assyrians were never systematically written, so far as extant documents show. The royal papyrus at Turin might have furnished a valuable guide had it not been shattered beyond repair. The lists of Manetho (*q. v.*) are valuable, but they have been preserved in such fragmentary and contradictory shape by Eusebius, Josephus, Africanus, and others, as to have lost much of their usefulness. They furnish, nevertheless, the only practicable way of locating historical events by dynasties. In terms of our era only the latest dates can be fixed accurately: e. g. Necho, 609–595 B. C.; Shishak about 930 B. C.; Ramses II. in the thirteenth century, and Thothmes III. possibly in the fifteenth century B. C. Amenemha I. is variously put at 2130, 2380 and 2466; Khufu (Cheops, Suphis) at 2830 (Meyer), 3124 (Lepsius), 3766 (Brugsch); while Menes is put at 4400 (Brugseh), 3892 (Lepsius), 5613 (Unger), 5004 (Mariette), 5867 (Champollion), and 5650 (Wiedemann). Each of these estimates is as little capable of proof as the others. The immense differences are due to the various theories touching contemporary dynasties, a problem of exceeding difficulty. It seems probable, however, that Manetho gives in his list only the legitimate rulers, and has passed over in silence those whose claims were ill founded.

General.—Of the development of the Egyptian kingdom and of the conditions which preceded the reign of Menes, the first king, the inscriptions tell nothing. Manetho speaks of gods, demi-gods, and sovereigns from Thinis and Memphis, while the royal papyrus at Turin enumerates beings called "Followers of Horus," as the precursors of Menes. These beings of course were mere myths. It has been claimed that traces of a stone age are found in Egypt, but proof is still lacking, since the remains thus far found can be assigned to historical times. At the opening of their history the Egyptians seem to have stood on about the same level as the present inhabitants of the Somali coast, so far as dress was concerned, but otherwise they were possessed of an ancient culture which presupposes a long period of development. The kingdom of Menes was already organized as fully as that of the later kings, the main difference being only in its extent.

The data of the early history of Egypt are mainly isolated facts, statements of the exploits of various kings and private persons. A connected history of native origin does not exist. The Turin papyrus and Manetho are often in contradiction with the monuments. The lists of kings at Abydos (see Memnonium) give only a selection, though the tablet of Seti I. contains 76 names and that of Ramses II. 18 names. The list of Saqqarah comprises 42 names. It is upon such a basis as this that the framework of Egyptian history and chronology has been formed, supplemented by many inscriptions, which supply an immense amount of bombastic phrase of a laudatory character, combined with a vanishing modicum of historical information. The gaps in the list and the Oriental habit of glossing over defeat and internal dissension have left us with a very fragmentary notion of the chronology of the people who possessed the most ancient known culture of the world.

On page 15 is a list of the Egyptian dynasties, compiled mainly from Wiedemann's history, showing the order of the dynasties, the names by which they are known, the number of kings in each according to various authorities, the length of the dynasties according to Manetho, and the names of some of the principal kings.

Old Kingdom.—No inscriptions have survived from the first three dynasties, though the "step-pyramid" of Saqqarah is ascribed to Uenephes (Egyp., Ata), the fourth king of the first dynasty, and some statues of functionaries of the time have been preserved. Of Menes (*q. v.*), the first king, little is known except that he hailed from This (i. e. Thinis) in Upper Egypt, and founded Memphis. The lists of kings given by Manetho are fairly confirmed by the monuments of following times. With the fourth dynasty contemporary records begin to appear in the tombs (see Mastaba) and pyramids of Gizeh and Saqqarah, built by Snofru (Manetho, Soris, *q. v.*), Khufu (Cheops; Manetho, Suphis (*q. v.*), Chefren (Chafra, Khafra), and Menkara (Mycerinus, *q. v.*) for themselves and their nobles. From the tombs a knowledge of the life of the times is derived, and in the execution of the scenes depicted there is evidence of a developed artistic sense. The long reigns of these kings were employed in building these and other structures in all parts of the land. An unpublished papyrus at St. Petersburg tells of an invasion of the Delta by Asiatics in the time of Snofru, which led to the building of the fortifications on the isthmus at the avenues of approach. See Shur.

LIST OF THE EGYPTIAN DYNASTIES.

Order.	Names.	NUMBER OF KINGS.					LENGTH IN YEARS.	Principal kings, etc.[1]
		Manetho.	Abydos.	Turin.	Saqqarah.	Monuments.	Manetho.	
I.	Thinite	8	8	7	2	4	253	Menes.
II.	Thinite	9	5	6	6	2	302	
III.	Memphite	9	5	7	7	3	214	
IV.	Memphite	8	6	2	4	6	277	Snofru, Khufu, Khafra, Menkara.
V.	Elephantiné	9	8	4	8	6	248	Unas.
VI.	Memphite	6	5	1	4	5	203	Teta, Pepi (Phios), Pepi (Phiops), Queen Nitocris.
VII.	Memphite[2]	70		..	..	..	...	
VIII.	Memphite	27		..	..	..	146	
IX.	Heracleopolite	17	19	..	..	..	409[3]	
X.	Heracleopolite	17		..	..	..	185	
XI.	Theban	16		..	..	..	43	
XII.	Diospolite	8	7	3	7	8	160	Amenemha I.–IV.; Usertasen I.–IV.
XIII.	Theban	60	..	..	..	..	453[4]	
XIV.	Xoite	76	..	..	..	..	484[5]	
XV.	Hyksos	6	..	..	..	..	260	
XVI.	Hyksos	?	..	..	..	..	251	
XVII.	Theban	?	..	..	..	..	?[6]	
XVIII.	Diospolite	16	..	..	..	13	348[7]	Ahmes I.; Amenophis I.–IV.; Thothmes I.–IV.; Hatasu.
XIX.	Diospolite	6	..	..	..	6	194[8]	Seti I.–II.; Ramses II.; Meneptah.
XX.	Diospolite	..	..	..	..	12	135[9]	Ramses III.
XXI.	Tanite	7	..	..	..	5	130	Her-Hor.
XXII.	Bubastite	3	..	..	..	9	120	Shishak; Osorkon.
XXIII.	Tanite	4	..	..	..	2	44[10]	
XXIV.	Saite.	1	..	..	..	1	6[11]	
XXV.	Ethiopian	3	..	..	..	3	44[12]	Sabaka; Tirhaka.
XXVI.	Saite	6	..	..	..	6	131[13]	Psammetichus I.; Necho; Hophra.
XXVII.	Persian	8	..	..	..	5	120	
XXVIII.	Saite	1	..	..	..	1	6	
XXIX.	Mendesian	5–6	..	..	..	5	...	
XXX.	Sebennyte	3	..	..	..	3	30[14]	Nectanebo I.–II.
XXXI.	Persian	3	..	..	..	..	9[15]	
XXXII.	Macedonian	..	..	..	..	..	27	
XXXIII.	Greek	..	..	..	..	..	275	
XXXIV.	Roman	..	..	..	..	..	411	30 B. C.–381 A. D.

[1] See separate articles.
[2] 70 kings in 70 days; another version, 5 kings in 75 years.
[3] Or 4 kings in 100 years; Dynasties VII.–XI., a dark period, information uncertain.
[4] Or Bubastite, 153 years, in another version.
[5] Also given as 184 years.
[6] Africanus gives 43 kings in 151 years.
[7] Josephus, 17 kings; Africanus, 263 years.
[8] Africanus gives 209 years; the monuments 107.
[9] ? 178 years; monuments, 142.
[10] Africanus, 89 years.
[11] Monuments, 6; Syncellus, 44 years.
[12] Africanus, 40; monuments, 38+ years.
[13] Figures vary from 124 to 143¼ years.
[14] Monuments show 35+ years.
[15] Syncellus, 16 years.

During this period and the following changes occurred; art lost its primitive simplicity and freshness, taking on a stereotyped form, which was an object of imitation in later times. Under the last king of the fifth dynasty, Unas (Manetho, Obnos, *q. v.*), the practice of inscribing the chambers of the pyramids began, which was continued under the sixth dynasty by Teta (Othoes, of Manetho), Pepi I. (Phios), and Pepi II. (Phiops). Toward the end of the reign of Pepi I., third king of the sixth dynasty, a most notable ruler, whose monuments extend from Tanis to Denderah, a decentralization seems to have begun. Memphis was no longer the necropolis of the whole land, but Abydos, where myth located the grave of Osiris, sprang into prominence never to be displaced. Many other resting-places for the dead were also sought out. Nearly all that is known of this period and that of the following two kings is derived from a long inscription of Una, a contemporary noble already mentioned. Pepi II., the fifth king, waged war with the Beduin (see above) and defended the mines of Sinai, which had been previously worked. Queen Nitocris (*q. v.*) closed the dynasty. Thence till the eleventh dynasty there is a long period of darkness, but the interval seems to have been filled up with the gradual development of the power of the nomarchs, till finally in the eleventh Thebes stood forth in the lead. In this period the ancient religion and writing underwent change, for in the twelfth dynasty many new forms appear. Thebes became the chief city, and maintained its position for ages. It was from Thebes also that the later opposition came which ended in the expulsion of the Hyksos after the next dark period in the history. In each case the country must have gone through troublous times, and while the names of many kings are known, they are incapable of chronological arrangement. The eleventh dynasty, however, was a period of renaissance, though it was rude compared with what preceded. Changes are seen in the stelæ and in the sarcophagi, while the hieroglyphs are clumsy. The princes of the time were obscure, but the power of rulers was growing, and in the following dynasty (twelfth) it was fully exerted under the Usertasens (*q. v.*) and Amenemhas, so that, from being limited to the Thebaid, these kings reached out to Ethiopia and Syria, acquiring the former by conquest, while trade opened friendly relations with the East. The state was reorganized and placed on a firmer footing and in wider relations than ever before. For the first time the nation entered upon foreign conquest, the territory conquered being that south of the first cataract as far as Semneh and Kumneh (see Halfa, Wadi), where Usertasen III. placed fortresses to guard the new frontier. At home temples were erected at various places, and tombs were excavated from the rock at Beni Hasan and Siut (*q. v*). Some colossi at Tanis and Abydos come from the same source. From Amenemha III. proceeded an undertaking which required great engineering skill, the construction of Lake Moeris (*q. v.*), in the Fayum, excavated as a reservoir for surplus water to be used for irrigation in seasons of low Nile. The dynasty lasted 160 years, its kings were regarded as ideal rulers, and its language and orthography were classical models for after ages.

But this period was as an oasis in the desert. In times following, till the close of the seventeenth dynasty, there must have been great commotion and internal unrest. The monuments are few, though the names of rulers who must be assigned to this interval number upward of 150. The state was in a weakened condition, offering itself an easy prey to the invading Hyksos (*q. v.*). Concerning these people little is known; they left few traces of themselves in buildings and monuments to tell their story. The length of their stay is unknown, only that they were worshipers of Sutech (*q. v.*), and that their strongholds were Avaris (see Pelusium), San (see Tanis), and Bubastis (see Pi-Beseth). They threw the country into still greater confusion, but seem to have been content for the most part to remain quietly within their strong places in the Eastern Delta, and to receive tribute from the vassal Egyptian princes. But civilization was not dead even under the weight of this barbarian oppression, and in the seventeenth dynasty it began again to appear. The tombs at Gurnah (*q. v.*) testify that an organized state existed, and it is evident that the native kings were in control at least as far north as Thebes. The cause of the outbreak which ended in the expulsion of the Hyksos hordes was religious. Apepi, the Hyksos, demanded of Ra-sekenen, the "prince of the southern city," Thebes, that he renounce the worship of Amen-Ra and adopt that of Sutech. A refusal led to war, which became aggressive on the part of the Thebans till it developed into a struggle for supremacy lasting for years. It was brought to a successful close by Ahmes I., the first king of the eighteenth dynasty, who in his third campaign not only drove the Hyksos from their last stronghold,

Avaris, but pursued them into Palestine. In so doing he opened a new epoch. Whereas before Egypt had been self-contained, content to remain within its northern borders, and only advancing in conquest toward the south, now the road to Asia became familiar, and the age of conquest began. With surprising rapidity she became a warlike nation, and soon carried her arms to the Euphrates and to the Sudan. Mementos of the northward movement are seen in the introduction of the worship of Baal and Astarte, and in the use of many foreign names.

Following are some of the principal events of the dynasty. Amenophis I., the third king, subdued the Libyans at the west of the Delta. Thothmes I., his successor, marched southward to the third cataract in his first campaign, and Cush became an Egyptian province under a special governor, who was a person of prestige at court. His second expedition took him through Palestine and Syria to the Euphrates, on whose farther bank he erected a monument to record his prowess. He was followed by Thothmes II., Hatasu (*q. v.*), and Thothmes III. (*q. v.*), all his children, but by different wives, the mother of Thothmes III. not being of royal blood. Hatasu is noteworthy for the expedition which she fitted out to bring incense, wood, animals, such as the cynocephalus, or dog-headed ape or baboon, etc., from the land of Punt (*q. v.*). The record is preserved in stone in the temple walls at Der-el-Bahari (see Thebes), with pictured details of great interest. But it was under Thothmes III. that Egypt gained its greatest extension of power. Fifteen expeditions made him master of the lands west of the Euphrates and south of Amanus. In his first he marched unresisted to Megiddo, and there overthrew his allied foes. In his sixth he overcame the Hittites, who first appear during his reign, and captured their chief city, Kadesh. In the Sudan he was also active. By a remarkable chance his mummy has been preserved to us. The two following kings held their own, but Amenophis IV. scattered the seeds of internal discord when he undertook to supplant the current solar religion by a novel and monotheistic phase of the same. He discarded his earlier name, which was tainted with the name of Amon, and chose a new name compounded with *aten*, the title of the sun-disk, Khunaten (*q. v.*). For similar reasons he left the earlier residence of the kings, and established himself at Tell el-Amarna (*q. v.*). His relations with the Semitic races of the East have been revealed by the clay tablets found at Amarna. Not long after his death his city was destroyed, and the anti-reform movement triumphed, through the efforts of the priests.

With the nineteenth dynasty the old status was restored, and after a brief interval the policy of conquest was again adopted. Conditions in Palestine and Syria had changed. The kingdom of the Hittites had become consolidated and powerful. Seti I. (*q. v.*), the first king, claimed to have overcome them, but his victory is doubtful, to say the least. It is true, however, that he overthrew the Libyans and their allies from the "islands" of the sea. Ramses II. (*q. v.*), his successor, made several expeditions: in his first year through Palestine, in his fifth year as far as Kadesh on the Orontes, and finally in his twenty-fifth year he made a treaty of peace with the Hittite king, and took his daughter to wife. This treaty lasted through his long reign, and probably till the fall of the Hittites at the hands of the hordes of the north, the "inhabitants of the islands," whoever they may have been. During the long reign of sixty-six years of Ramses II. Egypt saw many changes. It has been estimated that half of the buildings in Egypt bear his cartouche. This leaves out of account, however, his constant practice of usurping monuments by replacing earlier royal names with his own, usually in so slovenly a manner that it is quite possible to read the original characters. Nevertheless, genuine remains are found, from his colossus at Tanis to the rock-cut tombs of Abu-Simbel (see Ipsambul) in Nubia—indications of his amazing power. Meneptah (*q. v.*), his son, confined his attention to the Libyans on the west, and overthrew them in his fifth year, though they returned under his successors. During his reign probably occurred the Exodus (*q. v.*) of Israel, indicating a weakened condition of the land, which continued under Seti II. and lasted for years.

The twentieth dynasty opened with Ramses III., who reigned thirty-two years. He worked the mines of Sinai and traded with the south. The Libyans who had settled as far south as Memphis were driven out, and in his eighth year he gained a victory over unknown races called "the people of the north, in their islands," who appear to have subdued the Hittite kingdom and to have advanced by land and water against Egypt. It is probable that these were the people who later appear as mercenaries, and who finally grew to be a dangerous power in the land. The remainder of this Ramesside dynasty (Ramses IV.–XIII.) was weak; the sovereigns were the tools of priests and mercenaries by turn, till the priest dynasty (the twenty-first) of Herhor (*q. v.*, Manetho, Smendes) and Pinotem (Manetho, Psusenes usurped the throne. Our main indebtedness to those sovereigns is in the fact that they hid the remains of their great predecessors so thoroughly that they remained in a rocky chamber at Der el-Bahari undiscovered till 1881. During these periods of weakness the Libyan power was developing again, and under Sheshonk I. (Bibl., Shishak, *q. v.*) and Osorkon (*q. v.*) of the twenty-second dynasty, about 930 B. C., it so dominated Egypt that even the governors of cities and the high priests at Memphis and Thebes were Libyans. The adherents of the royal priesthood fled to Ethiopia and there founded an Egyptian kingdom with Napata (*q. v.*) as its capital, and with the priests of Amon in actual power. This kingdom continued through the two following dynasties, twenty-third and twenty-fourth. During the earlier the Ethiopian Pianchi conquered Egypt as far as Memphis; the later, consisting of one king, the Bocchoris of the Greeks, was overthrown to make room for the Ethiopian (twenty-fifth) dynasty under Sabaka (*q. v.*) in 716 B. C. With Sabaka, who is supposed to have been the "So" of the Bible, and with Taharka (Bibl., Tirhakah, *q. v.*), the Hebrews had relations of confederation, as also with Necho (*q. v.*) and Apries (Manetho, Uaphris: Bibl., Hophra, *q. v.*) of the following (twenty-sixth) dynasty (see below). The efforts at foreign conquest put forth by those kings came to nothing in the face of superior power, but at home there was peace for about 138 years. During this time Psemtik I. (Greek, Psammetichus, *q. v.*) built in many parts of the land; efforts were made to establish commerce in new regions, and under Necho a fleet circumnavigated Africa. The establishment of Greek colonies in the Delta at Naucratis and Daphnae was also promoted, but with results which in the long run were detrimental to the ancient order of things. In the earlier contests with Assyria the confederations came to naught, and finally Essarhaddon conquered the land as far as Thebes, making Egypt an Assyrian province from 662–654 B. C. With the aid of Greek mercenaries Psammetichos I. expelled them, and endeavored to restore the land to its former greatness, introducing the titles, language, writing, and art of the old kingdom. It was a period of renaissance, but in the nature of things it could not be permanent. The rising Persian kingdom threatened, and when Cambyses in 525 B. C. met Psammetichos III. at Pelusium, a single battle sufficed to overthrow him. The Persian rule continued till 400 B. C. amid numerous popular uprisings, incited by members of the ancient royal line who maintained an independent existence in the marshy lands of the Delta. The Persian power became weakened, and was finally overthrown. Thence nearly till the arrival of Alexander the Great in 332, the twenty-eighth to the thirtieth dynasties held sway, having with Greek aid broken the Persian yoke. The most famous of the rulers between 400 and 332 B. C. was Nectanebo I. (*q. v.*) of the thirtieth dynasty, who not only successfully held his own against the Persians, but also pursued the arts of peace at home, building and repairing temples throughout the land. With Nectanebo II. in 345 B. C. the native rulers ceased, when after a valiant but ill-advised campaign he fled to Ethiopia with such treasures as he could gather hastily, leaving Egypt to become again a Persian satrapy for a brief space. This triumph was short-lived, and in 332 Alexander the Great was hailed as the deliverer of Egypt.

Under the Ptolemies (I.–XVI.) Egypt's old commanding position was lost, but it began to assume a place of importance as an intellectual center. Old temples were renewed and new ones were built. This period gave us the historical work of Manetho and the Septuagint version of the Scriptures, while about the wonderful library of Alexandria there grew up a class of men distinguished by their love of letters and science.

After the death of Cleopatra, Egypt became a Roman province governed by prefects. The ancient religion, writings, and customs were conserved, and the priests preserved the ancient fiction of Pharaohs, sons of Ra, the sun-god. Even Decius, 250 A. D., appears as a Pharaoh after Egypt had become Christian. But so far as power and national feeling were concerned Egypt was dead. The Roman em-

perors wrote their names in hieroglyphics under a wretched orthography and they built temples, but this was probably as an expedient for holding the people in a more quiet subjugation. While political death had come, intellectual life revived under the influence of Christianity, and for centuries its influence was felt in the world of Christian thought. The edict of Theodosius in 381 A. D. making Christianity the religion of Egypt, marked the annihilation of the ancient *régime*, whose only reminiscence was the Coptic language which became the vehicle of Christian, especially Gnostic, thought and the speech of divine service. See COPTS, COPTIC CHURCH, and COPTIC LANGUAGE AND LITERATURE.

Egypt and the Bible.—The references to Egypt found in the Hebrew Scriptures evince an intimate acquaintance with local conditions. An interesting question arises in connection with this, which has not received investigations, viz., the exact periods to which these correspondences point, since the results of such an inquiry would throw light upon the time when the Hebrew writings were composed. With regard to natural phenomena there is substantial agreement. On the basis of these some of the plagues have been explained. (See PLAGUES OF EGYPT.) References to agriculture and manufactures are true of nearly all periods, as are also those to customs. The biblical name of the kings in the earlier periods is uniformly Pharaoh (see above), giving no hint as to the identity of any individual and rendering identification on any mutual basis impossible. The geographical names mentioned in Scripture are nearly all large and well-known cities, except some connected with the Exodus of the Israelites (see EXODUS), such as Pithom, Goshen, Etham or Shur, Migdol, etc. Ramses, the second store-city built by the Israelites, still awaits identification, unless it is the same as Tanis, which occasionally bears the name of Pi-Ramses. Syene, Hanes, No-Amon, Noph, On, Pi-Beseth, Tahpanhes, Zoan, and probably Sin, are well known. (For further particulars, see separate articles.) The discovery of PITHOM (*q. v.*) by Naville in 1883 was of immense importance in fixing the early stages of the route of the Exodus.

All efforts to find mention of the Hebrews on the Egyptian monuments or other records have failed. But the Hebrew Scriptures contain many historical references to Egypt and her kings. The dates of the entry of Abraham and Joseph are absolutely unknown, and traditions are worthless. The period of the sojourn of the Hebrews is passed over in silence, and it was only by approximation that the conclusion was reached that Ramses II. was the Pharaoh of the Oppression and Meneptah the Pharaoh of the Exodus, conclusions wonderfully confirmed by the discoveries at Pithom. Solomon married the daughter of a Pharaoh, unnamed (1 Kings iii. 1), and Hadad the Edomite fled to another, also unidentified (1 Kings xi. 17, 18). SHISHAK (*q. v.*, see also above) is the first king mentioned by name, and to him Jeroboam fled (1 Kings xi. 40; xii. 2; 2 Chr. x. 2). The same Pharaoh conquered Rehoboam and took Jerusalem, apparently without a struggle (1 Kings xiv. 25). He celebrated his victory on the wall of the temple of Amon at Karnak. The identity of "Zerah the Ethiopian" (2 Chron. xiv. 9–13; xvi. 8) is uncertain, but "So," better Seve (2 Kings xvii. 4), with whom Hoshea had dealings, is believed to have been Sabaka of the twenty-fifth dynasty. In 720 B. C. Sargon overthrew the conspirators. King Hezekiah placed reliance on TIRHAKAH (*q. v.*) the Ethiopian (2 Kings xix. 9) in his contest with Sennacherib, but he proved a "staff of a broken reed" (2 Kings xviii. 21). NECHO (*q. v.*), of the twenty-sixth dynasty, made an expedition to the east, encountered, overcame, and slew King Josiah at Megiddo (2 Kings xxiii. 30), and moved on to the Euphrates. Jehoahaz was meantime made King of Judah, but was deposed and deported by Necho who installed Jehoiakim as a tributary vassal. The face of things was soon changed by Nebuchadnezzar in 606–605 B. C. HOPHRA (*q. v.*), the Greek Apries, made a faint attempt to draw off Nebuchadnezzar from Jerusalem, but was repulsed with heavy loss (586 B. C.). In consequence of troubles arising soon after, the Prophet Jeremiah was carried down to Egypt by Jonahan and settled temporarily at TAHPANHES (*q. v.*). A little later the prophecy of Jeremiah (Jer. xliii. 8–13) was fulfilled, and Nebuchadnezzar penetrated Egypt as far as Syene, though without making it a permanent possession. After the Babylonian exile the Hebrews had no connection with Egypt that is recorded in their books, but it was in consequence of their presence in the land, where they adopted the Hellenistic Greek as the tongue of trade, that we have the Septuagint version of the Pentateuch and of other Hebrew writings.

CHARLES R. GILLETT.

MODERN EGYPT.

The division of Egyptian history into ancient and modern is somewhat arbitrary and irrational, and yet on some accounts it is a matter of convenience and is not wholly without justification. The Roman occupation, extending from 30 B. C. to the Mohammedan conquest in 640 A. D., divided the history of Egypt into two somewhat distinct parts. The Mohammedan period and the period before the Roman conquest present to the student quite as many suggestions of contrast as of similarity.

History.—When the Greek domination established by Alexander the Great was overthrown by Augustus Cæsar, Egypt became a simple province ruled by a Roman prefect. During the 425 years that elapsed before the death of Theodosius in 395 A. D., there was no essential change in the form of administration. The most noteworthy event of this period was the introduction of Christianity. As early as the first century A. D. the new faith succeeded in establishing itself in the valley of the Nile; and only a few years later the neighboring deserts saw the rise of that peculiar phase of Christianity which found expression in the cenobites and anchorites. The growth of these sects compelled the Church to introduce certain important modifications into its early organization and methods. The firmness of the hold which Christianity early acquired in Egypt is illustrated by the fact that inscriptions are found showing that as early as the middle of the third century the new faith had acquired a dominant place in the hearts of the people. The old cult received its complete overthrow at the end of the fourth century, when Theodosius, in 389 A. D., proclaimed the establishment of Christianity, and ordered the temple of Serapis at Alexandria to be thrown down. With this edict the science and literature as well as the religion of ancient Egypt came to an end; for during the fourteen hundred years that followed no one was able to read the inscriptions or interpret the ruins. At the death of Theodosius in 395 the country became a part of the Eastern Roman empire, and was governed as such without event here worthy of note until the Mohammedan invasion in 640.

The period that ensued was one of turmoil. The Arab caliphs maintained their domination from 640 till 1250; the Sultan Mamelukes from 1250 to 1517. The Turks conquered the country in 1517, and held it in resistless subjugation until the French invasion and conquest in 1798. In 1801 the hold of the French was relaxed, and the overlordship of Turkey was soon afterward re-established and recognized. During all the period from 640 to the nineteenth century there are but few events that are worthy of note. The first of these was the destruction of the great library at Alexandria, which contained vast treasures of Greek literature and art. The invasion leading to the overthrow of Roman power was led by Amru, a general of the Caliph Omar, who, after the fall of Alexandria, wrote to the caliph: "I have taken a city which beggars all description, in which there are 4,000 palaces and 400 theaters." By the conquest and the destruction of the Alexandrian library, Greek civilization, after flourishing 900 years, came to an end, and the political domination was transferred from the Roman Government to caliphs, who resided first at Damascus and afterward at Bagdad. This power was not interrupted till about 970, when the country was conquered by the Fatimites, who established their dynasty at the new city of Cairo. The petty quarrels that characterized the following period were for a time raised to respectability by Saladin, the famous enemy of the crusaders. Saladin acceded to power in 1170. At his death in 1193 his sons were unable to unite the members of the empire; but the Saracens were strong enough to defeat the crusaders led by the French king, Louis IX., who was taken prisoner in 1248. Immediately after this important event a revolution of the MAMELUKES (*q. v.*) was successful, and the political and military power remained in their hands till the invasion of Bonaparte in 1798.

At the battle of the Pyramids, fought July 23, 1798, an army of 35,000 French, led by Bonaparte, completely overthrew the Mamelukes, whose power had filled the land with turbulence during two centuries. Bonaparte's purpose was to destroy the Turkish rule in Asia as well as in Africa, and thus make possible an attack upon Europe from the

East as well as from the West. But his failure at Acre defeated this purpose, and had an immeasurable influence on his subsequent career. After the first great battle Bonaparte left Egypt in the hands of Gen. Kleber, whose early death made it possible for the united forces of Turkey and England to acquire the ascendency. After the withdrawal of the French, however, in 1801, the several military elements lost their cohesive power, and the control was gained by Mehemet Ali, who was raised to the rank of Pasha of Cairo in 1804. In one respect an important service was rendered to Egyptology by the French invasion. Bonaparte took into Egypt with the army a large number of French savants, who were directed to explore the topography, natural history, and antiquities of the country; and their report, published in 1809–13 in 25 vols. (2d ed. 26 vols., 1821–30), with more than 900 very elaborate engravings, exerted a powerful influence on the advancement of the knowledge of ancient Egypt.

Mehemet Ali, though nominally a vassal of the Turkish sultan, acquired and maintained a substantial independence. He was fully imbued with the European spirit, and founded a vast number of schools and colleges. Manufactures were encouraged and commerce was organized. The full extent of his power and influence was not confined, however, to internal improvements. In 1830 he invaded and conquered Syria, and a few years later, encouraged by his military successes, he threw himself into revolt against Turkey. The Turkish army was defeated at the battle of Nizeeb in June, 1839. Two years later the great powers of Europe interfered to check the victorious progress of Mehemet Ali, and by treaty in 1841 established Egypt as a viceroyalty of Turkey, hereditary in the family of the viceroy. This most celebrated of modern Egyptian rulers, however, became imbecile in his last days, and the sultan, in July, 1848, appointed his adopted son Ibrahim regent. Ibrahim lived, however, only five months, and at his death was succeeded by Mehemet Ali's grandson, Abbas Pasha, whose ambition seemed to be limited to the restoration of Mohammedan power and the overthrow of the reforms begun by his grandfather. On his death, however, in 1854, he was succeeded by Said Pasha, a younger son of Mehemet Ali. In 1863 he was succeeded by Ismail Pasha (a son of Ibrahim), who received from the sultan in 1867 the title of khedive. Ismail Pasha devoted himself to internal improvements with great zeal, though not with equal intelligence. By various means he acquired great personal wealth while he was negotiating immense foreign loans for the improvement of the country. Taxes became so oppressive that the people refused to pay them. They finally rose in revolt, and in Aug., 1879, drove the khedive from power. He was succeeded by his son, Mohamed Tewfik, but the new khedive found the finances in such confusion that he was soon obliged to invoke the aid of European governments in order to raise the means necessary to pay the interest on the public debt. The British and French Governments were practically given control of all the sources of revenue. This course was so repugnant to the people that in the spring of 1882 a revolt broke out headed by Arabi Pasha, the Minister of War. The party cry of "Egypt for the Egyptians" seemed for a time destined to carry all before it. But the government was supported and sheltered by the army and navy of France and Great Britain. Accordingly, early in July the insurgents directed an attack upon the fleet lying near Alexandria for the protection of foreign interests. On the 11th the British fleet in return bombarded Alexandria, and two months later the British army defeated Arabi at Tell-el-Kebir, and reinstated Tewfik in power. The control of the finances now practically passed into British hands, and for the protection of this policy British troops remained in practical possession of the country. They were soon called into active service, for a formidable revolt of the Mahdi (*q. v.*) in the Sudan threatened not only the power of Egypt in the far south, but also the British as well as the Egyptian interest in the Suez Canal. The British, however, did not pursue a vigorous policy. Though Gen. Gordon with a small force had been sent to the Sudan in 1884, he was inadequately supported, and finally before relief could be secured was assassinated at Khartoum in Jan., 1885. The failure of the British in this expedition led to their withdrawal from the Sudan and the temporary abandonment of the southern part of the vast territory just north of the equator which a few years before had acknowledged allegiance to the khedive. With the support of the British the remaining years of Tewfik were free from turbulence. He was succeeded by his son Abbas Pasha in Jan., 1892. In 1896 a military expedition supported by British troops reconquered the province of Dongola, and it is intended in 1898 to proceed as far as Khartoum and Omdurman.

Land.—An expedition under Ismail Pasha, third son of Mehemet Ali, overran and occupied Nubia in 1821–22, and later expeditions pushed the frontiers to the S. as far as Berbera on the Red Sea and up the Nile valley to a point between Khartoum and the equator. When, in 1885, the Sudan was temporarily abandoned, Wadi Halfa (about 22° N. lat.), near the second cataract, became the most southerly point of Egypt proper. It now extends from about 18° N. lat. to the Mediterranean, and from the Red Sea on the E. to the Libyan Desert on the W. The total area, excluding the province of Dongola, is about 400,000 sq. miles, but the cultivated portion covers only about 12,976 sq. miles. The Egypt of politics and trade lies between the mouths of the Nile and the first cataract, in lat. 24° 3′ N., and consists of a narrow strip averaging only about 7 miles in width. This territory, however, broadens out at the north into a rich and prosperous plain known as the Delta. The fertility of this narrow belt is in striking contrast with the arid and desolate region lying on either side. The source of the country's fertility is its great river, the Nile, which, having its sources in the heart of Africa, pours down its volumes of fertility and annually distributes them over the surface of the adjacent country. Below the cataract it receives no tributaries, but the rainfall and the melting snows in the mountainous regions of the south are enough not only to overcome the loss from evaporation, but also to add so enormously to the volume of the water at periodical intervals as to prove a source of great fertility and wealth. For 3,000 years the average annual rise of the river at Thebes has been about 36 feet, and at Cairo about 25 feet, while near the mouths of the river it has been about 4 feet. The whole of the level country in the valley is inundated every autumn, and as the water subsides the soil is found to be covered with a thin film of fertilizing material. The average permanent addition to the soil by the inundations amounts to about 4½ inches in a century. The river discharges itself into the Mediterranean at the rate of more than 150,000,000,000 cubic meters per day during the low period, and at the rate of more than 700,000,000,000 during high Nile. Ordinarily it is from half to three-quarters of a mile wide, but from the middle of July to the middle of December it formerly gave the country the appearance of a "sea," as the Egyptians themselves described it. The ancient nilometers show that considerable changes of level have occurred since the twelfth dynasty; at Semneh, near the second cataract, the lowering has amounted to 24 feet. As the Nile is the only water-supply for land, man, and beast, it was found necessary to provide means for conserving it. To-day a very elaborate system of irrigation, especially in Lower Egypt, retains a considerable part of the water in reservoirs and canals for subsequent use.

Products.—In a great many localities the soil is from 10 to 15 feet in depth, and the climate is such that the agricultural year includes three crops. The inundation subsides in November, after which the winter crops, including nearly all cereals, are sown, and are ready for harvest in May and June. The summer crops, including cotton, sugar, and rice, are sown in July and harvested just before the autumn floods in September and October; while the autumn crops, consisting of vegetables, maize, sorghum, and rice, are sown in June and July and gathered in September and October. The most important products of the country are cotton and wheat; of the former, 906,000 acres were planted in 1899, and of the latter in the same year the acreage was 1,262. The area in maize was 1,592,000 acres; that in sugar cane, 67,120; in beans, 650,000; in barley, 400,000; and in rice, 175,000.

People.—The Turks, although the ruling class, constitute but a small portion of the population. The number of foreigners residing in Egypt in 1897 was as follows: Greeks, 38,175; Italians, 24,467; French, 14,155; Austro-Hungarians, 7,117; British, 19,557; Germans, 1,277; other nationalities, 7,778. The Arabs constitute the larger part of the population, though the Copts, who are supposed to be descended from the ancient Egyptians, number over 600,000. During the nineteenth century the average annual increase in the number of the population has been 1½ per cent. In 1800 the French Government estimated the population at 2,000,000. In 1846 the first census showed a population of 4,463,244. In 1872 there were 5,203,405, and in 1897 9,734,405. Of the

cities, Cairo had in 1897 a population of 570,062; Alexandria, 319,766; Damietta, 31,288; Tantah, 57,289; Mansourah, 34,997; Zagazig, 35,715; Assiout, 42,012; Port Said, 42,095; Fayoum, 31,262. See EGYPT, in the Appendix.

Government.—Egypt is ruled by a monarchy independent on certain conditions. Formerly subject to Turkey, it acquired substantial independence under Mehemet Ali, who was appointed governor of Egypt in 1804. Mehemet Ali and his immediate successors were recognized as viceroys on condition of paying a certain annual tribute to the sultan, and this title was recognized by the great powers of Europe. In 1867 the title was changed to khedive (or king), and the independence of Egypt was assured on condition of paying an annual tribute of $3,600,000 to the Turkish Government. In 1873 the sultan granted to the khedive the further right of concluding commercial treaties with foreign powers, and of maintaining an army and navy. The khedive has the advice of a council of ministers, which (in 1898) consists of six members: a Minister of the Interior, of Finance, of Justice, of War, of Public Works (including education), and of Foreign Affairs. Since 1883 the government has been further popularized by providing for a legislative council, a general assembly, and various provincial boards. These bodies are chosen by a modified universal suffrage, but their powers are only advisory. For purposes of administration the country is divided into six governorships of cities and fourteen provinces. The governors of cities and provinces are vested with extensive powers.

Finance and Commerce.—The system of internal improvements, undertaken about the middle of the nineteenth century, together with wasteful irregularities on the part of the Government, produced almost hopeless financial confusion. Accordingly, in Apr., 1880, the khedive was forced to appoint an international commission to examine the financial situation and draft a law to regulate the division of the income between the Government and the creditors. The commission estimated the income available at £8,361,622, and of this amount they assigned £3,463,734 to the payment of interest and the liquidation of the debt, and £4,897,888 to the Government for current expenses. The floating debt at the time was found to be about £8,000,000. In 1885 the representatives of Great Britain, Germany, Austria, France, Italy, Russia, and Turkey signed a convention agreeing to guarantee a new loan of £9,000,000 for the purpose of funding the floating debt, and enabling the Government to complete certain important works of irrigation. The guarantee thus afforded has given a constant influence to the European powers over the finances of the country. Since 1883, on the recommendation of the British Government, the khedive has had an English financial adviser, without whose concurrence no important financial measures have been taken. The financial situation has been somewhat complicated by the part of the foreign powers in the construction and maintenance of the Suez Canal. Of the stock owned by the khedive the British Government bought, in 1875, 176,602 shares for the sum of £3,976,582, an amount which enlisted the interests of the British in a proper administration and care of the canal. In 1898 the net profits of the Suez Canal were 48,789,818 francs, of which 15 per cent. must be paid to the Egyptian Government, 10 to the founders' shares, 2 to the employees of the company, 2 to the managing directors, and 71 to dividends on the shares of stock. In 1899 the exports of Egypt were £E15,351,908; the imports £E11,216,405. The income of the Government for 1899 was £E11,415,000, and the expenditures, including interest and principal on public debt, £E10,254,000, leaving a surplus of £E1,161,000. The railways in 1892 were 1,158 miles in length, and the telegraph lines 3,168 miles. Both railways and telegraph lines are for the most part under the administration of Europeans.

Religion and Education.—The prevailing religion of modern Egypt has been Mohammedan since the conquest in A. D. 640. The Copts, however, above 600,000 in number, are Christian descendants of the ancient Egyptians, and members of the Greek Orthodox Church. The Christian hierarchy consists of a patriarch, who resides at Cairo and has jurisdiction over Egypt and Abyssinia, and twelve bishops, besides a large number of priests, deacons, and monks. The priests are obliged to marry before they can be ordained. At the head of the Mohammedan hierarchy is the Sheik-ul-Islam, whose jurisdiction embraces the entire realm of the khedive. The history of education in Egypt is peculiarly interesting. The caliphs fostered learning at Alexandria and Cairo with a liberality which excelled anything that had previously been shown by Greeks or Romans. They not only founded libraries and colleges for higher education, but they encouraged secondary and primary schools in the cities and villages. The system of *wakfs* (religious foundations) threw the protection of the Church over property set apart for educational purposes, and secured it against spoliation at the time of the Turkish invasion. It was by reason of these foundations that, while Europe was passing through the gloom of the Middle Ages, learning flourished in Egypt as nowhere else, save possibly under the Moorish rule in Spain. After the conquest by the Turks, however, learning steadily declined. The savants who accompanied Bonaparte found few traces of the old learning, and the schools confined their instruction for the most part to lectures on the Koran, the lives and traditions of the prophets, the study of the Arabic language, and a little elementary arithmetic and geography. What was done by the French produced small results; but on the accession of Mehemet Ali new efforts were put forth. For the organization of the army on a European plan a staff school was established at Cairo, and placed under a young officer whom the viceroy had sent to Europe to be educated for this purpose. Special schools were also established for the education of army surgeons. This movement in behalf of the army was followed by the establishment of special schools for military engineering, veterinary medicine, languages, practical mechanics, and agriculture. The professors were either brought from France or were educated in France for this purpose. The impulse thus given to education by Mehemet Ali has been fruitful in the development of a more or less complete educational system. There are now established three classes of schools: (1) Those founded and supported wholly or in part by the Government; (2) the old mosque colleges and Arab primary schools; (3) the schools belonging to the non-Mussulman communities, which, though not under the state control, are liberally supported by the khedive. Of the first class there are nine special schools, the most important of which are the polytechnic, in which instruction is given in the higher mathematics, chemistry and physics, geology, mechanics, and other technical branches. The professions of law and medicine are taught in courses of four years each, and no less than eleven professors give instruction in history and language. Of the second class of schools the most famous is the celebrated college or university of El-Azhar (the splendid), which occupies the oldest mosque in Cairo. This has long been the most famous university of Islam. In 1881 the number of students attracted to El-Azhar was 11,095, and these were taught by a corps of professors as many as 325 in number. The instruction, however, consists largely of interpretations of the Koran and of Arabic literature. That the learning here taught is much less advanced than that which prevails in the higher Government schools may be inferred from the fact that the pre-Copernican theory of astronomy prevails, and that pupils are still taught that the sun moves around the earth, that the earth is flat, and that the firmament consists of seven superimposed canopies. In the whole country in 1887 there were 6,637 schools, in which there were 7,244 teachers. The teachers are generally paid by fees, and education is not compulsory. There are, however, 17 mosque schools with 2,000 pupils, and in all 15 Government schools of a higher grade. Besides these there are 21 national schools of a middle grade in the chief towns. For purposes of administration about 100 pupils are educated in Germany, France, England, Austria, and Italy at the expense of the Government.

AUTHORITIES.—On ancient Egypt, the first and most important work is that already mentioned, published by the savants who accompanied the expedition of Bonaparte (2d ed. 26 vols., 1821–30). Next in importance is Lepsius, *Denkmäler aus Ägypten und Äthiopien* (12 vols., 1849–59). Since Lepsius, the most worthy of note are the following: Brugsch Bey, *Recueil de monuments égyptiens* (2 vols., 1862–63); Mariette Bey, numerous works, all of which are important; Dümichen's *Hist. Inschriften* (2 vols., 1867–69); and *Gesch. des alt. Ägypten* (1878); Maspero, *Histoire ancienne des peuples de l'orient* (1875); Saul's *An Account of the Manners and Customs of the Ancient Egyptians* (2 vols., 1836; 5th ed. 1871); Wilkinson, *Manners and Customs of the Ancient Egyptians* (5 vols., 2d ed. 1878); Edwards, *A Thousand Miles up the Nile* (1876); McCoan, *Egypt as it is* (1877); Rawlinson, *History of Ancient Egypt* (2 vols., 1882); Paton, *History of the Egyptian Revolution from the Period of the Mamelukes to the Death of Mehemet Ali* (2 vols., 2d ed. 1869). For still more recent

history see the works of Vogt (1882); Royle (1886); Planchett (1889); and Maspero (1889). C. K. Adams.

Egyptian Architecture: the architecture of ancient Egypt; characterized by the grandeur of its conceptions, the simplicity of its constructive scheme, the massiveness of its forms, and its masterful use of carving and color to enhance the splendor of its architectural details. The Egyptians in all their important structures eschewed the arch, with whose form and principles they were nevertheless perfectly familiar, but produced overwhelming effects of solemn majesty by the use of enormous built-up columns bearing lintels of prodigious size. Their architecture, so far as known by its remains, was one mainly of temples and tombs, having bequeathed to us no important vestiges of palatial or domestic edifices, and its greatest works are buildings of one story, but of vast extent. Symbolic carvings, hieroglyphics, and paintings play a large part in its decorative scheme, but are never allowed to disturb the impressive repose of the architectural forms themselves. The temples of Karnak, Luxor, Medinet-Abou, Abydos, and the Ramesseum are the grandest examples of the art of the Ramesside epoch; Edfu, Denderah, and Philæ, of the Ptolemaic; while the temple-caverns of Abu-Simbel and the innumerable rock-cut tombs of the Nile valley exhibit another phase of Egyptian architecture, unrivaled unless by the cave-temples of India. The pyramids hardly rank as architecture, but evince the constructive resources and daring of the Egyptians in the time of the fourth dynasty, perhaps 3500 years B. C., and point to a previously existing architecture, of which no traces now remain. Limestone and granite, with a coarse sandstone for the rougher masses of masonry, and brick dried in the sun for exterior circuit walls, seem to have been the materials most in use. Further particulars may be found in the article Architecture. A. D. F. Hamlin.

Egyptian Language and Literature: the language and literature of ancient Egypt; covering the same period which the political history (given under Egypt) included, with the addition of the life of the Coptic language. Altogether, it must be reckoned at about 5,000 years, extending from the fourth millennium B. C. to the tenth or eleventh century A. D., having the antecedents of the pyramid texts at the beginning and the latest Coptic writings in the Boheiric dialect at the end. The Coptic was the only key to the elder forms of the language, and yet its earliest remains were separated by 3,000 years from the beginnings of the literature. But this immense interval was not the main difficulty. The language itself had undergone a development from a simple to an agglutinative character. The original form has been found to differ widely from the forms which characterize the Middle and the New Kingdoms, and these again from each other. The differences are so great that each period has to be provided with a special grammatical treatment of its peculiar features.

Periods of the Language.—Taking a broad view, there are five periods in the development of the tongue of Egypt, marked off more or less distinctly by breaks in the history of the land. (See historical sketch in the article Egypt.) The first belongs to the fifth and sixth dynasties, the second is that of the eleventh and twelfth dynasties, the third includes the eighteenth and following dynasties till the appearance of the fifth, in the Demotic character, and sixth the Coptic. (See Coptic Language and Literature.) Each one of these shows features unknown to the preceding, and in these altered features the linguistic development consisted.

Styles of Writing.—Similarly there were three styles of writing, exclusive of the Coptic. The earliest was the hieroglyphic, but of its origin nothing is known, since in its first appearance it is a finished product. This style of picture-writing remained unaltered in its essential features through all the grammatical changes which the language underwent, and was always the official script used for stone monuments. (See Hieroglyphics.) Out of it was developed, for more rapid writing on papyrus and similar materials, a shortened form known as the hieratic, so called because it was supposed to be the script used by the priestly scribes. The third style was the demotic, consisting of further contractions of the hieratic forms so abbreviated that all resemblance to the hieroglyphic entirely disappeared. The literature contained in this script forms a special field of study by itself. Under Greek and Christian influence it was replaced by the Coptic alphabet, borrowed from the Greek, which retained only six or seven letters from the old to represent sounds foreign to the Greek.

Alphabet and Graphic System.—The basis of the Egyptian writing was an alphabet representing twenty-four consonants, four of which were used in the later periods as vowels or semi-vowels. (For a careful statement of the values of the primitive alphabetic signs, illustrated by a wealth of special learning, see Dr. Georg Steindorff's article, *Das altägyptische Alphabet und seine Umschreibung*, in the *Zeitschrift der deutschen morgenländischen Gesellschaft*, vol. xlvi., 1892, pp. 709–730.) But these simple alphabetic signs were far from exhausting the wealth of characters possessed by the Egyptians. *Syllabic* and *word signs* were employed in large numbers and in an increasing proportion as time passed, either alone or in connection with alphabetic complements which served the purpose of indicating the particular value attaching to a sign in any given connection. *Determinatives* were also employed after individual words to indicate the nature or quality of the thing or act mentioned.

Relation to Hebrew.—The question of the relations between the Egyptian and other languages rose early. Lepsius (*Nubische Grammatik*, Berlin, 1880) investigated the languages to the south, but the difficulty exists that the comparisons which are possible are between phases of the languages which are separated by long intervals of time, and give no reliable results. Benfey (*Ueber das Verhältniss des Ägyptischen zum semitischen Sprachstamm*, Leipzig, 1844) compared the Coptic and Hebrew, but with misleading results. His knowledge did not extend far enough, and leading scholars are content to await the results of completer investigation before expressing a conviction. That there was some connection between the Semitic and Egyptian is clear from considerations deeper than the mutual borrowing of individual words. In fact these borrowed words which occur in the periods subsequent to the Hyksos domination are to be regarded with suspicion, unless they can be traced back to a period anterior to the thirteenth dynasty, i. e. to the Middle Kingdom. A large number of such words exist, and also some which have the appearance of a common origin. But the signs of linguistic relationship which are most striking are those which relate to grammar and syntax. As in Hebrew, the signification of a word depends on its consonantal constituents, while the modal relation depends upon the vowels, which remained for the most part unwritten in both the Semitic and Egyptian. The roots in both were formed by radicals numbering from two to five, the higher number being obtained usually by reduplication. The Hebrew *status constructus* is a single example of a general law of the Egyptian by which verb and subject, verb and object, the genitive construction, and even the verbal clause are combined as in a single word, with the accent at the end. The use of pronominal suffixes was similar, and the pyramid texts show a usage analogous to the *aleph prostheticum* of the Hebrew. See Erman, *Verhältniss des Ägyptischen zu den semitischen Sprachen* (*Zeitsch. d. deutsch. morgenl. Gesellsch*, 1892, vol. xlvi., pp. 93–129); Bondi, *Dem hebräisch-phönizischen Sprachzweige angehörige Lehnwörter in hieroglyphischen und hieratischen Texten* (Leipzig, 1886); Wiedemann, *Altägyptische Wörter welche von klassischen Autoren umschrieben oder übersetzt worden sind* (Leipzig, 1883), and *Die ältesten Beziehungen zwischen Ägypten und Griechenland* (Leipzig, 1883).

Grammar.—The study of Egyptian grammar in any proper sense is a work of recent date. Its slow progress is due to the peculiar difficulties which beset it. The script is confused, liable to be misunderstood, and defective in that it leaves the vowels unnoted and frequently omits even consonants. The texts are often in a ruinous condition, and their contents are of a nature difficult of comprehension. The only aid outside of the hieroglyphic writing itself is that supplied by the Coptic, which is not only widely separated in time, but has retained only the infinitive and a sort of participle from the many forms discovered in the ancient language. Nevertheless it has been found possible to learn much concerning the grammatical structure of the ancient language of the Old Kingdom, as distinguished from the Middle and New, in spite of the fact that it is largely composed of magical contents, and is written in a peculiar orthography new to Egyptologists.

Each word had a single accented long vowel, the others being merely serviles. When words were combined to form a compound expression, vowel changes occurred as in Coptic, and the accent went to the end. Pronominal relations

were expressed by suffixes; the possessive with nouns and the subject with verbs. Demonstrative pronouns are varied and rich. Substantives are masculine and feminine, the latter being used in most cases to express the neuter. Preformative *m* formed, as in Hebrew, a considerable number of nouns, and the *nisbe* ending in *i* is similar to the Semitic formation. The dual is also found. Adjectives are formed from nouns by an appended half-vowel. The names of the numerals 2, 6, 7, 8, and 9 were similar to the Hebrew. Verbs contain from two to five radicals, and are classed as active, intransitive, and passive. The only formation in the early language resembling the Hebrew conjugation, such as the Hiphil, and resulting in a change of signification, is the causative, obtained by prefixing an *s*; but this addition was treated as an integral part of the stem to such an extent as to alter the classification of the verb in question. Marks of inflection are present, but they can not be determined with accuracy. The only remnant is seen in the Coptic participle, which is a survival of an early intransitive or passive pseudo-participial form. Of the infinitive and participle little is known. The vocalization of the infinitive is conjectured on the basis of the Coptic. Verbal substantives were formed by peculiar endings, and verbal adjectives are also found. The original genitive relation was expressed by simple juxtaposition, later by a declinable adjective, which still later weakened into a preposition. The usual order of words in the sentence was verb, subject, object; but this was varied when the object was a pronoun, and also for emphasis. Demonstratives and attributive adjectives follow the noun. The object in the sentence is only known by its position; emphatic words are given a prominent place, and ellipsis occurs not infrequently.

The foregoing statement is based mainly on the pyramid texts of the fifth and sixth dynasties. Other texts of about the same period exist, but unfortunately they consist almost exclusively of lists of mere titles claimed by the deceased, and are almost absolutely valueless for grammatical investigations. See Erman, cited above.

Knowledge of the grammar of the Middle Kingdom has progressed mainly through the efforts of Erman and his pupils in Berlin, but no fuller statement has appeared than that in his *Sprache des Papyrus Westcar* (Göttingen, 1889), which he designates as a "preliminary study." Several papyri are extant from this period, but they are either medical (*Ebers*), mathematical (*Rhind*), didactic (*Prisse* and *Sallier II.*), or poetical (three in Berlin). Their style is so evidently artificial and stilted that it is difficult to base rules of correct usage upon them. Mortuary texts from this as from other periods are of little grammatical value.

In the New Kingdom the grammar developed still further, and sufficient material has been preserved to enable Erman to present the most complete treatise on Egyptian grammar that has ever appeared. (*Neuägyptische Grammatik*, Leipzig, 1880.) Many new forms are found, while many old ones have weakened and disappeared. The documents used as sources are more numerous, and they are written in the freer language of the common people. In official texts the effort to copy the ancient modes of orthography and speech is seen, but in the papyri this gave way to a style at once more natural and more appropriate to popular tales, songs, and prose narratives.

Sources.—The sources from which a knowledge of Egyptian literature is derived are the inscriptions on stone monuments or on such objects as sarcophagi, and texts written on papyrus and such other materials as parchment, wood, potsherds, etc. From the earlier periods the former only have survived, and in fact they comprise the larger proportion from all epochs.

Pyramid Texts.—The oldest long texts extant are those contained in the five pyramids of the kings of the fifth and sixth dynasties, and are usually called "pyramid texts." They were discovered in 1880, and have since been published by Maspero (*Recueil de travaux relatifs à la philologie et à l'archéologie égyptiennes et assyriennes*, Paris, 1882 ff). Their recovery dates a new epoch in Egyptological study, for while difficult to read even in the light of previously acquired knowledge, they have shed light upon old problems, though at the same time they have multiplied the problems awaiting solution. They contain an extensive collection of religious and magical texts engraved not later than 2500 B. C. Judging by antique features, they are only explicable on the assumption that they are the remains of a literature which flourished in the fourth millennium B. C.

Papyri.—The earliest papyrus purports to have been written by a prince of the fifth dynasty, Ptah-hotep by name (*Papyrus Prisse*), and another of ancient date claims Amenemhat I. of the twelfth dynasty for its author. The medical papyrus (*Ebers*) was compiled under Amenophis I. (Amenhotep, eighteenth dynasty) from more ancient documents, and the mathematical papyrus (*Rhind*) was copied under a late Hyksos king from an original dating from the time of Amenemha III. (twelfth dynasty). Other papyri from this period have been mentioned above. Numerous texts of a religious nature are also extant from this period, but the large majority of papyrus texts are those of the subsequent ages. Among the latter which deserve the name of literature are the following: Tales—*The Tale of the Two Brothers* (*Select Papyri*, published by the British Museum; *Orbiney Papyrus*; *Records of the Past*, ii.); *Capture of Joppa*, and *The Doomed Prince* (*Harris Papyrus*, the latter translated in *Records of the Past*, ii.); the *War against the Hyksos*, and the poem of the *Battle with the Hittites* (*Sallier Papyri*). Legal documents—*Proceedings against Grave-robbers* (*Amherst* and *Lee* papyri); *Process for High Treason* (*Turin*, *Rollin*, and *Lee* papyri); *Private Complaints* (*Salt* Papyrus). Original letters—in *Papyri Anastasi vi.*, *viii.*, *ix.*, *Mallet*, *Bologna ii.*, *Leiden*, *349*, *360–370*, and collections of letters in *Anastasi Papyri*, *iii.*, *iv.*, *v.* See Erman, *Neuägyptische Grammatik*, Leipzig, 1880, p. 2 f.

Authorship.—The question of authorship of Egyptian papyri is one of some uncertainty. Postscripts occasionally mention an individual with the statement that the writing was "made by" him. Whether this is an ascription of literary authorship or of mechanical execution such as that of a scribe is uncertain, but the weight of probability inclines toward the latter view.

Classifications of Egyptian Literature.—The earliest classification of Egyptian literature that we have is that of Clement of Alexandria, Christian bishop in the latter half of the second century, who designates (*Stromata*, vi., 4; cf Lepsius, *Chronologie*, 1849, pp. 45 ff.) five classes: 1. Ten hieratic books on the laws, the gods, and on priestly training. 2. Ten books relating to the priestly office, on offerings, festivals, hymns, prayers, processions, and the like. 3. Ten books for the sacred scribes, on hieroglyphics, cosmography, topography of temple lands, lists of temple furniture, etc. 4. Four books on astrology. 5. Two books for the singers, on hymns and on the royal life. But this classification is unintelligible to us on any known principle (see Brugsch, *Ägyptologie*, p. 149). The classification given by Brugsch himself (*id.*, p. 159 f.) is quite exhaustive. It consists of two departments. I. Sacred literature (in the hieroglyphic and hieratic character): 1. Hymnology; 2. Rituals and liturgies; 3. Books in reference to temple service and the priestly classes; 4. Charms; 5. Magical books and directions for the preparation of talismans; 6. Decrees in honor of gods and kings; 7. Worship of trees and beasts; 8. Tombstones and inscriptions in memory of the dead; 9. Writings in relation to the dead, with the RITUAL OF THE DEAD (*q. v.*) at the head. II. Profane literature: A. Scientific: 1. Astronomical; 2. Calendars and festivals; 3. Chronological; 4. Historical and biographical; 5. Mathematical; 6. Geometrical; 7. Statistical; 8. Geographical; 9. Natural science; 10. Medical; 11. Architectural. B. Belles-lettres: 1. Didactic; 2. Tales and adventures; 3. Dialogues of the dead; 4. Fables of animals; 5. Histories and legends of the gods. C. Mercantile, etc.: 1. Reports and letters; 2. Bills of sale; 3. Rental contracts; 4. Receipts for loans; 5. Partition agreements; 6. Documents relating to inheritances; 7. Marriage contracts; 8. Judicial proceedings; 9. Complaints to officers; 10. Market prices and bills; 11. Receipts; 12. Oaths; 13. Lists of persons and private papers.

Origin.—The Egyptians ascribed the origin of their literature to the god THOTH (*q. v.*), the number of whose literary productions was variously estimated in late times at from 1,100 to 36,525. Having thus a divine originator, Egyptian literature was regarded as sacred. Thoth communicated learning to men, and it was handed down by copyists, but the idea of a fixed text, too sacred to be altered, does not seem to have found lodgment. Commentators arose who had no compunctions about changing the sense and meaning even when these are clear. In many cases their procedure is so curious that it can only be explained upon the supposition that the ancient texts were no longer understood even in the Middle Kingdom. Similarly the knowledge of the forms of the ancient language, although it was recognized as the official standard, was largely lost. Owing to this many errors are found in ex-

tant texts, both formal and material, which are capable of no other explanation. The extent to which the most sacred religious text was changed and amended is seen in Naville's monumental edition of the *Ritual of the Dead* of the eighteenth dynasty (*Das Ägyptische Todtenbuch der xviii. bis xx. Dynastie*, 2 vols. fol., Berlin, 1886). The corruption of the text has proceeded so far that it is not in the power of textual criticism to restore it to its original form so that each word shall appear in its proper form.

Religious Literature.—Although the number of texts written in the hieroglyphic and allied characters is immense, the bulk of them is of a religious nature, consisting largely of copies of the *Ritual of the Dead*, complete or partial, written on fragile papyrus, on the bands and sarcophagi of the dead, on temple walls and in tombs. The literary activity of the living was exercised mainly in the preparation for the life in the fields of Amenti, the land of the West, the future home of the deceased. The gods and the dead were objects of especial care. But in spite of the wealth of materials there is difficulty in obtaining a clear view of the religious conceptions of the Egyptians, because behind all their formulæ and ritualistic observances there is a background of mythology as yet imperfectly comprehended, which is nevertheless essential to a complete understanding of the religion in its essence. The references to these myths are numerous, but the particular events intended do not appear in detail. The ritualistic books are mere directories of observances; the *Ritual of the Dead* is a conglomerate made up of accretions during long ages.

Zodiac of the Temple of Denderah.

Tales and Narratives.—Egyptian literature is at its best in the tales which have been preserved dating from the periods of the Middle and New Kingdoms. The Egyptian was so lacking in imagination that when he left the region of simple prose he became bombastic, grotesque, and absurd. Yet the literary Egyptian, even when relating a plain and simple story, was wont to interject speeches and long letters which were evidently intended as literary adornments. It is a remarkable fact that most of these tales, and all of those couched in simple prose speech, come from the period subsequent to the Hyksos invasion and occupation. The so-called prose narratives of the previous period are probably poetic in their structure, being more artificial, less intelligible, and in marked contrast to those of the eighteenth dynasty, which show a style truer to the contemporary idiom and more natural than the official texts and the inscriptions in the bombastic style and antique language of their ancient models.

Poetry.—Closely allied to the tales are the poetical writings. Music and singing were practiced in all periods to express joy and grief, and the song was the universal accompaniment of labor. The specimens from the ancient kingdom are valuable mainly as showing the origin of the folk song. In the more artistic pieces of later times, alliteration was practiced frequently, and plays on words were carried to a great length. The "parallelism of members," familiar to us in the Hebrew poets, is frequent and sometimes very artistic. This parallelism is sometimes strict, sometimes free, and a poetical composition is occasionally arranged strophically. Rhythm was also introdueed, with a regular beat of accents, dependent upon the usual laws of Egyptian phonology. Long lines are interrupted in some of the manuscripts of the Middle Kingdom by shorter lines which mark transitions of thought as well as of meter. At times these lines are marked in red.

Letters.—A peculiar form of literature has been preserved in the collection of letters prepared by teachers for their pupils. Some contain praise of the occupation and advantages of the learned scribe, who is released from the toil and fatigue of the soldier and the laborer. Others contain moral instruction, the precepts of etiquette, and the formulæ of elegant intercourse. They are cast in the form of instruction given to the young by their elders, or to pupils by their teachers, in a style that is to us often far from clear. In the later, and especially in the demotic, periods, letters, contracts, and private documents afford glimpses of

the life of the people which could scarcely be had from any other source.

Historical Writing.—Lists of kings engraved on temple walls and the single royal papyrus of Turin, containing the names of the kings and the length of their reigns, are all that can lay claim to this name. Most of the historical texts consist of brief accounts of the deeds of individuals and of kings, which may have been based upon official annals, but of such documents, if they ever existed, none have survived.

Astronomy.—The so-called astronomical writings are rather of an astrological nature. Our knowledge is derived mainly from the temple of Ramses II. at Thebes, the tombs of Seti I., Ramses IV. and VII., and the sarcophagus of Ramses IX. (cf. Lepsius, *Chronologie*, p. 62 ff.). Ptolemaic texts have been preserved at Philæ, Edfu, and Ombos, and they show similar characteristics. Only after the Roman period do the signs of the zodiac appear. Nevertheless, the Egyptians were close observers of the stars, and some of their charts are interesting.

Mathematics.—In mathematics the decimal system was employed. Single short lines, numbering from one to nine expressed units, while there were separate signs for 10, 100, 1,000, etc. In later times special signs were used for 9, 60, and 80, and later still for 5, 7, 8, 10, and 30. The *Papyrus Rhind* is the thesaurus of Egyptian mathematical lore. Eisenlohr, *Ein mathematisches Handbuch der alten Aegypter* (Leipzig, 1877).

Chemistry.—It can not be doubted that some chemical knowledge was possessed by the ancient Egyptians, since the existence of glass, artificial stones, and alloys bears witness thereto; but no writings have been found to set forth their attainments for our enlightenment.

Medical Writings.—The practice of medicine was empiric, and remedies were held in high esteem in proportion to their age. Incantation was an essential portion of the physician's stock in trade. The largest extant work is the *Ebers papyrus*, compiled in the eighteenth dynasty from documents then antique. The recipes bear the names of ancient personages, and are arranged under the name of the disease and its symptoms, with directions as to administration. Such texts are difficult to understand on account of uncertainty as to the internal bodily organs intended, the character of the particular illness and its symptoms, the articles of the pharmacopœia, and the values of the weights and measures. German translation, Joachim, *Papyrus Ebers, Das älteste Buch über Heilkunde* (Berlin, 1890). The original, by Ebers and Stern (Leipzig, 1875).

Judicial Texts.—There are many judicial texts, especially from the nineteenth and twentieth dynasties. They report legal prosecutions of persons accused of treason, murder, theft, body-snatching, robbery of tombs, defacement of temples, falsification, perjury, infliction of bodily damage, and the like. Documents have survived containing private complaints, made in due form. Among the most interesting documents are some reports upon the condition of royal tombs alleged to have been rifled. Some were found intact, while in the case of others the allegations were sustained. Chabas, *Une spoliation des hypogées de Thèbes; Traduction analytique du papyrus Abbott* (Paris, 1870).

The difficulties which beset the investigation of the Egyptian grammar affect all efforts at translation. Even a slight comparison of the various translations of the same text made by successive persons, or even by the same scholar after a lapse of years, shows the progress made in the interval. The method is one of approximation in the case of any long text. There can be no doubt that the best translations approach closely to the sense of the original, but this is by no means scientific in exactness of rendering. In the language of the New Kingdom the grammar is better settled than elsewhere, and consequently the translation of New Kingdom texts approaches nearest to perfection. But in the Middle and Old Kingdoms there is so much uncertainty that any rendering must be only provisional. It is one thing to give the meaning of a text in a general way and quite another to be able to render it upon the basis of a perfect understanding of grammar and syntax. To the latter no claim can be made. The most available translations into English are those of *The Records of the Past* (2 series, 18 vols., London and New York), though all histories of Egypt contain samples of Egyptian literature in modern dress.

CHARLES R. GILLETT.

Egyptian (or **Maltese**) **Vulture**, called also **Pharaoh's Hen**: a small vulture (*Neophron percnopterus*) of Southern Europe, Africa, and Asia, occasionally seen in England. The young birds are brown; the adult bird has almost perfectly white plumage, with black wing feathers. These birds are valuable scavengers, protected by law and custom, and are half domesticated.

Egyptology: the science which concerns itself with the writing, language, literature, monuments, and history of ancient Egypt, from the earliest time to the extinction of the old pagan religion and civilization between the fifth and sixth centuries after Christ. It is a new science, having its origin in the beginning of the nineteenth century. M. Boussard, a captain of engineers under Bonaparte (1799), discovered in the trenches of Fort Julien, near Rosetta, a large block of black granite with the remains of three inscriptions, the first in hieroglyphs, the second in the demotic character, the third in Greek. This *Rosetta stone* was taken to England after the capitulation of Alexandria (1801), and presented by King George III. to the British Museum. It contains a decree promulgated at Memphis in honor of Ptolemy V. Epiphanes by the priesthood of Egypt in synod assembled, thanking that sovereign for the benefits which he had conferred upon them. They ordered it to be sent to all the temples of the first, second, and third rank, there to be engraved on stelæ in the three forms of writing then used throughout the land. When found, half of the hieroglyphic portion of the Rosetta copy was wanting, but the demotic and Greek were nearly complete, and the work of decipherment began with them. The French Orientalist Silvestre de Sacy made out in the demotic some of the proper names mentioned in the Greek (*Lettre au Citoyen Chaptal sur l'inscription égyptienne du monument du Rosette*, Paris, 1802); and the Swede Akerblad, following in his steps, assigned phonetic values to most of the signs employed in the proper names (*Lettre sur l'inscription égyptienne de Rosette adressée au Citoyen S. de Sacy*, Paris, 1802). In 1814 Thomas Young, the celebrated English mathematician, succeeded in isolating a number of groups which express common names, and even in translating some fragments of demotic phrases. Turning to the hieroglyphs he tried to determine the power of the characters which, being inclosed in cartouches or rings, were known to indicate the names of kings. Thus he read the names of Ptolemy and Bereniee, but he failed to analyze them exactly; five only of the values which he proposed for the signs turned out to be true. (*Archæologia*, vol. xviii., p. 60, 1817; *Encyclopædia Britannica*, 4th edit., vol. iv., 1st part, 1818.) The problem with which Young had such poor success was solved four years later by JEAN FRANÇOIS CHAMPOLLION (*q. v.*). Champollion had felt attracted to the study of the Oriental languages from his early youth, and published when only twenty-four years of age, under the title *L'Égypte sous les Pharaons* (2 vols., Paris, 1814), the first two volumes of a large work on the history and civilization of ancient Egypt. Guided by his thorough knowledge of the Coptic, he applied himself to the decipherment of the inscriptions, and ascertained very soon that the three kinds of characters found on the monuments, far from representing three independent systems, were three successive developments of one system of writing, of which the hieroglyphs were the prototype, the hieratic and demotic the cursive forms (*De l'écriture hiératique des anciens Égyptiens*, Grenoble, 1821). He then dissected the cartouches which had been studied by Young and proved that the hieroglyphs in them were always taken alphabetically, and that the alphabet thus employed for the rendering of Greek royal names was the same that had been used from the time of the first dynasties, not only for proper names, but for the common parts of the language. He gave a general outline of his system to the Académie des Inscriptions (*Lettre à M. Dacier relative à l'alphabet des hiéroglyphs phonétiques employés par les Égyptiens*, Paris) on Sept. 22, 1822, a day famous in the annals of science as marking the foundation of Egyptology. Then he completed his revelations, and explained fully his method in his *Précis du système hiéroglyphique des anciens Égyptiens* (Paris, 1824; 2d ed. 1827–28). He spent the last eight years of his life in working out the principles which he had established for the resurrection of the old Egyptian world, trying to elucidate the religion in his *Panthéon Égyptien* (Paris, 1823–26), the chronology and political history in his *Lettres à M. le Duc de Blacas d'Aulps relatives au Musée*

royal Égyptien de Turin (2 vols., Paris, 1824–26), the general archæology in his *Notice descriptive des Monuments Égyptiens du Musée Charles X.* (Paris, 1827). In 1828–30 he searched Egypt from Alexandria to Wadi-Halfa with the help of a selected band of French and Italian archæologists. Upon his return he was made Professor of Egyptian Literature in the Collège de France, but his strenuous activity, and especially the hardships to which he had submitted during his recent journey, had overtaxed his strength. He was seized with a fatal fever and died Mar. 4, 1832, a few days after he had delivered his first lecture. His rapid success had raised up a host of detractors and opponents. Klaproth criticised his work with a bad faith and a virulence which even death did not abate (*Examen critique des travaux de feu M. Champollion sur les Hiéroglyphes*, Paris, 1832); Spohn and Seyffarth started a rival system, which was rejected in Europe after the death of Uhlemann (1855), but which continued to find some degree of acceptance in the U. S. for more than thirty years. The general public, however, had received his labors with delight and immediately proclaimed his discoveries as among the most wonderful ever achieved in the domain of antiquity. After his death, men of every nation took up his teachings and advanced the work he had begun so well: Nestor Lhôte, Charles Lenormant, and Dulaurier in France; Salvolini, Rosellini, Ungarelli, and Baruechi in Italy; Leemans in the Netherlands; Wilkinson, Birch, and Osborn in England. Champollion-Figeac devoted himself to the memory of his younger brother, and published the most important of his unfinished books, his *Lettres écrites d'Égypte* (Paris, 1833); his *Grammaire Égyptienne* (Paris, 1836–41); his *Dictionnaire Égyptien en écriture hiéroglyphique* (Paris, 1841–46); his *Monuments de l'Égypte et de la Nubie* (Paris, 1835–75), completed, however, only by Maspero. Since then the story of Egyptology has been a perpetual record of success and discoveries. Lepsius analyzed critically in his *Lettre à M. le Professeur Rosellini sur l'alphabet hiéroglyphique* (Rome, 1837) the structure of the old language, and elucidated the origin and mechanism of the syllabic characters, the existence of which had only been surmised by Champollion. Lepsius, however, early left philological for historical and archæological researches. From 1837 to 1885 nearly every year was marked by the appearance of some important work from his pen: *Das Todtenbuch der Ägypter*; *Ueber die xii. ägyptische Königsdynastie*; *Einleitung in die Chronologie*; *Ueber den ersten ägyptischen Götterkreis*; *Königsbuch der alten Ägypter*, and many more. Large portions of these have become antiquated, but they formed the solid ground upon which the chronology and history of ancient Egypt have been built up. His three years' stay in the Nile valley at the head of a commission of German draughtsmen and scientists (1842–45) produced the gigantic *Denkmäler aus Ägypten und Äthiopien* (12 vols., Berlin, 1849–59), in which all the historical texts known at the time were reproduced by the skillful hand of Weidenbach. Bunsen popularized the ideas of Lepsius in his *Ägyptens Stelle in der Weltgeschichte* (Hamburg, 1849); Heinrich Brugsch, then a young man, applied himself to demotic texts (*Scriptura Ægyptiorum demotica*, Berlin, 1848); *Grammaire démotique* (Berlin, 1855). While things went thus in Germany, Emmanuel de Rougé commenced his labors in France with his *Examen critique de l'ouvrage de M. le Chevalier de Bunsen*, in which the merits of Bunsen's and Lepsius's work were fully recognized, while their errors and fallacious hypotheses were pointed out with a vigor of method and a certainty which placed the young author at the head of living Egyptologists. Emmanuel de Rougé has been termed the second founder of Egyptology, and he has a perfect right to the title. He remodeled the grammar in his *Chrestomathie Égyptienne* (Paris, 1867–76); he called back to life the first dynasties in his *Recherches sur les monuments qu'on peut attribuer aux six premières dynasties de Manithon* (Paris, 1866); he gave the perfect models of the method in which Egyptian texts should be commented upon letter by letter and word by word in his *Mémoire sur l'inscription d'Ahmes, chef des nautoniers* (Paris, 1851), in his *Étude sur une stèle égyptienne de la Bibliothèque Impériale* (Paris, 1856–59), and in his smaller pamphlets, and he was the first who really translated whole Egyptian books and inscriptions, both hieroglyphic and hieratic. He gave a new impulse to Egyptology not only in France, where Mariette, Chabas, Devéria, Pierret, and Maspero took the field after him, but also in England, where his influence was felt by Birch, Hincks, Lepage-Renouf, and in Germany, where Brugsch, Dümichen, Ebers, and Eisenlohr seconded the efforts of Lepsius. The elders of the German school are nearly all practical archæologists, who, like Dümichen, copied texts in the temples of Egypt and interpreted them in their relation to history and religion, or, like Ebers, popularized in ingenious novels (*Die ägyptische Königstochter*, *Uarda*, *Die Schwestern*) the knowledge they had acquired in their scientific researches. They are headed by the veteran Heinrich Brugsch (Brugsch Pasha), who may be said to be the last of the heroic generation which did not specialize within a narrow branch of the science, but took the whole field for its specialty. His *Grammaire* (Leipzig, 1872); *Dictionnaire hiéroglyphique* (Leipzig, 1867–82); *Geographische Inschriften* (Leipzig, 1857–60); and *Dictionnaire géographique de l'ancienne Égypte* (Leipzig, 1877–80); his *Matériaux pour servir à la reconstruction du calendrier des anciens Égyptiens* (Leipzig, 1864); his *Geschichte Ägyptens* (Leipzig, 1877); his *Religion und Mythologie der alten Ägypter* (Leipzig, 1885–88); his *Thesaurus Inscriptionum Ægyptiacarum* (Leipzig, 1883–91); and his *Ägyptologie* (Leipzig, 1891) are fundamental works, the great faults of which are lost in greater merits. With the exception of Wiedemann, whose turn of mind is decidedly historical, the more recent German school inclines more and more to grammars and philology under the lead of Adolf Erman, the successor of Lepsius both in the Museum and at the University of Berlin. On the other hand, the French school, though not adverse to philology, has directed its strength toward history and archæology since the death of Emmanuel de Rougé (1872) and of Chabas (1885). Auguste Mariette (Mariette Pasha) had opened the way for them by his immortal labors among the Egyptian ruins in the interest of both the French (1849–54) and Egyptian (1858–81) Governments. He had discovered the Serapeum of Memphis, freed the temples of Edfu, Karnak, Deir el-Bahari, Denderah, and Abydos from the rubbish which cumbered them, explored the whole Nile valley from Tanis to Napata, and collected in Boulak in 1859 that museum of antiquities which, transferred to Gizeh (1889), is one of the wonders of modern Egypt. The direction of Egyptian excavations passed from his hands to those of G. Maspero (1881–86) and E. Grebaut (1886–92), and descended in 1892 upon De Morgan, all of them Frenchmen. Moreover, the French Government maintains in Cairo a *Mission archéologique permanente*, founded in 1880 by Maspero and directed under his supervision by Lefébure (1881–83), Grebaut (1883–86), and Bouriant. Young Egyptologists are sent every year to Egypt to excavate, draw, copy, and publish the monuments. They are helped in the work of finding and preserving the remains of antiquity by an Anglo-American society, the Egypt Exploration Fund, the first secretary and real promoter of which was Miss Amelia B. Edwards (1882–92). In 1883 they sent out their first agent, Édouard Naville, of Geneva, and he cleared the site of Pithom in the land of Goshen. Since then Naville, Flinders, Petrie, Griffith, Gardner, and Newberry have been at work. Naucratis has come to light, Tanis and Bubastis, the Pyramids of the Fayum, the tombs of Beni-Hasan and El-Amarna have yielded unexpected treasures of archæological and historical lore.

Records begin to appear with the third dynasty of Manetho. The Sphinx of Gizeh is certainly older, but being

Sphinx and pyramid.

anepigraphous it is not known to which king or dynasty it belongs. A few stelæ bear the name of Sondou (second dynasty), and the step pyramid of Saqqarah purports to be the tomb of King Tosiri (third dynasty). These, however,

are isolated instances, and an unbroken line of monuments begins only under Snofroui, the last Pharaoh of the third dynasty (about 4300 B. C.). From his time to the death of Pepi II. (about 3800 B. C.) the necropolis of Gizeh, Saqqarah, Dashour, and Midoum, the tombs of the feudal families at Zawiet-el-Maietin, at Sheikh-said, at Kasr-es-Sayad, at Assuan, the rock graffiti of Wadi Magharah in the Sinaitic peninsula, furnish material enough to trace the succession of the kings and call back to life the whole civilization of those primeval ages. The series breaks off after Pepi II., and although the extensive chasm which was supposed to intervene between the fall of the Memphite and the rise of the Theban empire never existed except in the minds of modern archæologists, yet a few small scarabs and objects in the Louvre, a few tombs at Siout and Bersheh, are as yet the only records which bear witness to the power of the Heracleopolitan house. With the eleventh dynasty the monuments come to light again in great numbers, but whereas the relics of the previous centuries were concentrated, so to say, in the neighborhood of Memphis, the mementoes of the middle kingdom (about 3200–2900 B. C.) are equally dispersed all over the Nile valley, in the grottoes of Beni-Hasan, Bersheh, Siout, Assouan, in the private tombs of Thebes and Abydos, in the temples of Nubia and in the Delta cities, in the pyramids of the Fayum and the inscriptions of Sinai and Hammamat. There are many inscriptions and statues of the thirteenth and fourteenth dynasties, and the area of ground they cover from the fourth cataract to the sea shows how much the strength of Egypt had grown to be at that time. The invasion of the Hyksos suspended for at least four centuries the production of monuments (about 2100 B. C.), and nothing remains of their kings except a few names rudely scratched on statues of the older Pharaohs. Egypt revived after their expulsion, and the three Theban dynasties of the new empire (about 1750–1100 B. C.), enriched by the spoils of Asia as well as by those of Ethiopia, covered the banks of the river with temples and palaces, the ruins of which are to be counted by hundreds even after nearly two thousand years of neglect and destruction. Thebes, of course, received the best part of their care. The small sanctuary of Karnak was enlarged from year to year, and nearly every king held it a duty to add to the existing buildings a new hall, chapel, or pylon. Ramses I. planned the great hypostyle which Seti I. executed and Ramses II. decorated. To enumerate the names of all the Pharaohs who worked upon it would be to make a compendium of the history of Egypt under the following dynasties: Amenophis III. built the temple of Luxor; Thoutmes II. and Queen Hatshopsitou the terraces of Deir el-Bahari; Seti I. the Memnonium of Gournah; Ramses II. the Ramesseum; Amenophis III. the chapel, now destroyed, in front of which he erected his two colossal statues (Memnon's Colossi); Ramses III. the migdol of Medinet-Habu. In the western valley and at Bab-el-Molouk the vaults were excavated where reposed the mummies of the kings from Amenophis III. to the last of the Ramses. The cities of the Delta were restored by Ramses II. and his successors; Abydos was adorned with two magnificent temples by Seti I. and Ramses II. It was Ramses II. again who cut in the solid rock most of the speos and hemi-speos of Nubia, the more perfect type of which is to be found at Ipsamboul. The kings of the twenty-first, twenty-second, twenty-third, twenty-fourth, and twenty-fifth dynasties had enough to do to carry out the work which had been prepared for them by the Ramessides. But a new era opens for Egypt with the twenty-sixth dynasty. Psamatik I. and his successors Apries, Amasis, Nectanebo showed themselves great restorers of old monuments and great builders of new ones. Even the invasion of the Persians and their short domination could not stop the renaissance of Egyptian sculpture and architecture; it reached its highest point under the Ptolemies, who rivaled in that respect the most celebrated native Pharaohs. The various temples of Thebes, which were little better than heaps of ruins, owing to the Assyrian and Ethiopian devastations, were renewed by them, and Karnak became a kind of sacred museum where foreign tourists came to admire the past splendors of Sesostris. The old temples at Edfu, Denderah, Philæ, Ombos, Esneh, which had been slowly decaying for centuries, were pulled down and replaced by more magnificent edifices. The Roman Cæsars continued the constructions, and the reigns of the Flavians and Antonines are recorded by as many monuments in Egypt as in the rest of the empire. The impulse slackened under the African house of Severus, and died out completely in the middle of the third century A. D.; Philippus is the last emperor whose name was engraved officially in the hieroglyphic character. Though cartouches are profusely inscribed everywhere on the public buildings and in the tombs, accompanied often with a mention of regnal years, yet since the Egyptians never knew what it was to use a fixed era by which to date current events, it would be nearly impossible for us to derive a chronology and history of Egypt from the inscriptions if we did not possess lists or tables in which the kings are entered, each in his proper place. Some of these lists have come down to us in the original, but the most important of them, a canon written in hieratic at about the time of Ramses II. and now preserved in the museum at Turin, is so sadly mutilated that a great part of it is lost forever, and the disposition of all the fragments is not certain as yet. It has been published by Lepsius (*Auswahl der wichtigsten Urkunden der ägyptischen Alterthums*, pl. iii.–vi.). and better by Wilkinson (*The Fragments of the Hieratic Papyrus at Turin*, London, 1851). It is supplemented by a few hieroglyphical documents: The two tables of Abydos (Lepsius, *Auswahl*, pl. ii.; Mariette, *Abydos*, i., pl. xliii.); the table of Saqqarah (Mariette, *Monuments divers*, pl. lviii.); the *Chambre des Ancêtres* of Karnak (Prisse d'Avennes, *Monuments*, pl. i.); the small altar at Marseilles (F. de Saulcy, *Étude sur la série des rois*, Metz, 1863). The complete catalogue of the kings and dynasties from Menes to the Macedonian conquest was given in the Greek work of Manetho, an extract of which has been preserved for us and forms the basis of the history of Egypt. Many editions of the fragments have been issued since Lepsius tried to harmonize them with the hieroglyphic texts in his *Königsbuch*, and some of the leading Egyptologists have tried to interpret or correct them, or to make out of them various systems of chronology. Lieblein, *Ägyptische Chronologie* (Christiania, 1863) and *Recherches sur la chronologie égyptienne* (Christiania, 1873); Lauth, *Manetho und der Turiner Königspapyrus* (Munich, 1865); *Ägyptische Chronologie* (Strassburg, 1877) and *Aus Ägyptens Vorzeit* (Berlin, 1881); Unger, *Chronologie des Manetho* (Berlin, 1867); Krall, *Die Composition und die Schicksale des Manethonischen Geschichtswerkes* (Vienna, 1879). The history of Egypt, so far as its reconstruction has been possible upon the basis of these rather contradictory elements, has been variously written. Maspero, *Histoire ancienne des peuples de l'Orient* (4th ed. Paris. 1884), and Édouard Meyer, *Geschichte des Alterthums*, i. (Stuttgart, 1884), have tried to give it its proper place in the general history of the Oriental world; most others have studied it in itself, without any reference to the other nations except in so far as these conquered the Pharaohs or were conquered by them: Brugsch, *Histoire d'Égypte* (Leipzig, 1859), *Geschichte Ägyptens* (Leipzig, 1877; English translation by Philip Smith, 2 vols., London, 1882; the same condensed and revised by Mary Brodrick, London and New York, 1891); Birch, *History of Egypt from the Earliest Time to B. C. 300* (London, 1879); Erasmus Wilson, *The Egypt of the Past* (2d ed. London, 1882); Wiedemann, *Ägyptische Geschichte* (Gotha, 1884); and J. Dümichen and Ed. Meyer, *Geschichte des alten Ägyptens* (Berlin, 1880–87). The several epochs or dynasties have been made the subject of more or less extensive monographs: thus we have for the Memphite times E. de Rougé's *Recherches sur les monuments qu'on peut attribuer aux six premières dynasties de Manethon* (Paris, 1867) and Maspero's *La carrière administrative de doux fonctionnaires Égyptiens* (*Études égyptiennes*, ii.); for the Middle Kingdom, Lepsius's *Ueber die XIIte Königsdynastie* (Berlin. 1852); for the Theban times, Wiedemann's *Geschichte der XVIIIten ägyptischen Dynastie bis zum Tode Tutmes III.* (*Zeitschr. d. D. Morgenl. Gesellsch.*, xxxi.-xxxii., 1878), and Maspero's *Les Momies royals de Deir el-Bahari* (Paris, 1889); for the Saite period, Wiedemann's *Geschichte Ägyptens vom Psametich I. bis auf Alexander den Grossen* (Leipzig, 1880), Mallet's *Les premiers établissements des Grecs en Égypte* (Paris, 1893). The religion and mythology have been studied from two widely different points of view. Many Egyptologists share the opinions expressed by E. de Rougé (*Explication d'une inscription égyptienne, prouvant que les anciens Égyptiens ont connu la génération du fils de Dieu*. Paris, 1851; *Études sur le Rituel Funéraire des anciens Égyptiens*, Paris, 1860; *Conférence sur la religion des anciens Égyptiens et sur le monothéisme primitifs*, Paris, 1869) on the monotheism of the Egyptians and the reduction of all their gods to one, and that a solar

deity: thus Pierret, *Essai sur la mythologie égyptienne* (Paris, 1879) and *Le panthéon égyptien* (Paris, 1880), and Brugsch, *Die Religion und Mythologie der alten Ägypter* (Leipzig, 1885–88). Le Page-Renouf (*Lectures on the Origin and Growth of Religion as Illustrated by the Religion of Ancient Egypt*, London, 1880) considers the Egyptian mythology as being a disease of the language, according to the principles of the Max Müller school, while Maspero (*Études de Mythologie et d'Archéologie Égyptiennes*, Paris, 1892–93) insists on the animistic and naturalistic character of the Egyptian myths, as does also Wiedemann (*Die Religion der alten Ägypter*, Münster, 1890). Detailed accounts of the common life have been drawn by Wilkinson (*Manners and Customs of the Ancient Egyptians*, edited by Samuel Birch, 3 vols., London, 1878); by A. Erman (*Ägypten und ägyptisches Leben im Alterthum*, 2 vols., Tübingen, 1889); and by Maspero (*Lectures historiques: Égypte et Assyrie*, Paris, 1890; *Life in Ancient Egypt and Assyria*, New York, 1892). The art and architecture of Egypt have been treated by Perrot and Chipiez in the first volume of their great *Histoire de l'art* (Paris, 1881; English translation, 2 vols., London, 1883), and more briefly by Maspero in *L'Archéologie Égyptienne* (Paris, 1887; English translation by Amelia B. Edwards, London and New York, 1887; German translation by Georg Steindorff, Berlin, 1889). Some very good reproductions of Egyptian statues are to be found in O. Rayet's *Monuments de l'art antique* (Paris, 1880–84). The materials for historical and artistic subjects has been collected in several great works, the first of which was the *Description de l'Egypt* (Paris, 1809–30; 2d ed. 1820–30, followed by Champollion's *Monuments de l'Égypte et de la Nubie* (Paris, 1835–79); Rosellini's *Monumenti d'Egitto e di Nubia* (Pisa, 1832–44); Lepsius's *Denkmäler aus Ägypten und Äthiopien* (Berlin, 1849–59); and the smaller collections of J. Dümichen, *Altägyptische Kalenderinschriften* (Leipzig, 1868); *Altägyptische Tempelinschriften* (Leipzig, 1867); *Die Flotte einer ägyptischen Königin* (Leipzig, 1868); *Historische Inschriften altägyptischer Denkmäler* (Leipzig, 1867–69); *Resultate der archaeologisch-photographischen Expedition* (Berlin, 1869–71); Brugsch and Dümichen, *Recueil de monuments Égyptiens* (1862–85); E. de Rougé, *Inscriptions recueillées en Égypte* (Paris, 1877–79); Mariette, *Monuments divers* (1871–90), and others. But the time is past for these unmethodical compilations of material, in which texts of all periods are mixed, some complete, some in a fragmentary state. The better custom of publishing monographs in which one temple or one class of monuments is described as completely as possible is illustrated by Mariette's *Denderah* (Paris–Cairo, 1869–80), *Abydos* (Paris, 1869–81), *Deir el-Baharî* (Leipzig, 1877), and *Karnak* (Leipzig, 1875); the *Notices of Theban Tombs*, published by the members of the French mission; by Roehemontiex's *Edfu* (Paris, 1892); Benedite's *Philæ* (Paris, 1893); Gayet's *Louxor* (Paris, 1893), which are yet in course of publication.

The bulk of Egyptian literature has been preserved in papyri, nearly all of which are scattered in the various museums of Europe. Nine papyri out of ten contain the religious books and rituals which were placed with the mummies in the coffins or in the sepulchral rooms. The most famous of them is the *Book of the Dead*, or *Rituel Funéraire*, a compilation of prayers and magical incantations intended to insure the security of the soul in the other world, and to serve it as a sort of password in the travels it was compelled to undertake before reaching the Hall of Judgment and the Elysian Fields. Several copies of this book have been reproduced in faesimile by Lepsius (*Das Todtenbuch der alten Ägypter*, Berlin, 1842) and by E. de Rougé (*Rituel Funéraire des anciens Égyptiens*, Paris, 1861–64), but the standard edition is that projected by the International Congress of Orientalists in London (1874) and executed in part by Naville in *Das thebanische Todtenbuch der xviii. bis xx. Dynastie* (Berlin, 1886). It gives, however, those chapters only which are to be found in the manuscripts of the Theban period; for those which belong to the twelfth dynasty one must resort to *Die älteste Texte des Todtenbuchs*, by Lepsius (Berlin, 1867), to Maspero's *Mémoires de la Mission française du Caire* (tom. i., fasc. 2), and to the *Ancient Texts from the Coffin of Amamu in the British Museum*, by Birch and Le Page-Renouf (London, 1887). Translations of the whole book exist in English, prepared by Birch (in Bunsen's *Egypt's Place in Universal History*, vol. v., 1866) and by Le Page-Renouf (in the *Proceedings of the Society of Biblical Archæology*, from vol. xiv.); in French, by Pierret (*Per-m-hru, le Livre des Morts*, Paris, 1882). Some of the principal chapters have been translated or edited by Pleyte (*Étude sur le Chapitre 125 du Rituel Funéraire*, in *Études Égyptologiques*, ii., Leyden, 1868–70, and *Chapitres supplémentaires du Livre des Morts 162–174*, Leyden, 1881–82); by Guieysse (*Rituel Funéraire Égyptien, Chapitre 64e*, Paris, 1876); by Goodwin (*On the 112th Chapter of the Ritual*, in the *Ägyptische Zeitschrift*, 1871); by Lefébure (*Traduction comparée des Hymnes au Soleil composant le 150e Chapitre du Rituel* (Paris, 1868), and by others. The most common books of this sort, next to the *Book of the Dead*, were, in Theban times, the *Book of Knowing what there is in the other World*, and, in the Saite period, the various *Books of Breathing Anew*. The former has been edited by Lanzone (*Le domicile des Esprits*, Paris, 1879), and by Lefébure, *Le Tombeau de Seti I.*, in *Mémoires de la Mission du Caire*, tom. ii.); and it has been translated by Maspero (*Études de Mythologie*, tom. ii.). The *Book of Breathing Anew* has been both edited and rendered into Latin by Brugsch (*Saï-n-Sinsin, sive liber metempsychosis veterum Ægyptiorum*, Berlin, 1851). Rituals proper—that is, collections of the ceremonies and prayers performed in the temples and tombs—are very numerous; such are the ritual for the cult of the Theban Amon (O. von Lemm, *Das Ritualbuch des Ammondienstes*, Leipzig, 1882), the ritual for the services celebrated in the seven chapels of the temple of Seti I. at Abydos (Mariette, *Abydos*, i.), the ritual used while preparing the mummies (Maspero, *Le Rituel de l'Embaumement*, in *Mémoires sur qqs. papyrus du Louvre*, Paris, 1879). The *Opening of the Mouth* and the other rites performed on the day of burial, whether inside or outside of the tomb, have been preserved to us in the pyramids of the fifth and sixth dynasties, Ounas, Teti, Pepi I. and II., Mihtimsasnf, and in the private and royal vaults of the Theban cemeteries. The texts in the pyramids have been collected and translated by Maspero (*Recueil de Travaux*, i. to xiv.), and those of the Theban hypogees by Schiaparelli (*Il libro dei Funerali degli Antichi Egiziani*, Rome, 1880–90) and by Dümichen (*Der Grabpalast des Patuamenemap in der thebanischen Nekropolis*, Leipzig, 1884–85). Books of magic abound, though they are not as numerous as the strictly religious or ritualistic works. Most of them are unpublished as yet, but the translations of Chabas (*Le papyrus magique Harris*, Châlons-sur-Saône, 1861), Pleyte (*Étude sur une rouleau magique de Musée de Leyde*, in *Études Égyptologiques*, i.), Golenischeff (*Die Metternich-Stele*, Leipzig, 1877), and Lefébure (*Un Chapitre de la Chronique Solaire*, in the *Ägyptische Zeitschrift*, 1883) give a sufficient idea of the ways in which Pharaoh's magicians were wont to conjure the demons. That they were sometimes prosecuted as adepts in the black art is proved by the proceedings in a trial for high treason at Thebes during the reign of Ramses III. (Devéria, *Le Papyrus judiciaire de Turin*, Paris, 1865–68). Magicians acted oftener as physicians or surgeons, and no remedy could be properly applied without their help. About twenty treatises on medicine are known to exist, of which only two have been published: the *Papyrus médicale de Berlin*, by Brugsch (*Recueil de monuments*, tom. ii.), and the *Papyrus Ebers*, by Ebers and Stern (*Papyrus Ebers: ein hieratisches Handbuch altägyptischer Arzneikunde*, Leipzig, 1875). Ebers studied and published comments upon the portions of his papyrus which relate to diseases of the eye (*Papyrus Ebers: die Maase und das Kapitel über die Augenkrankheiten*, Leipzig, 1892), and a German version of the whole has been published by Dr. H. Joachim (*Papyrus Ebers: das älteste Buch über Heilkunde*, Berlin, 1890). No papyrus treating of astronomy has yet been discovered, but the calendars, zodiacs, astronomical and astrological tables which abound on the walls of temples and tombs at Ombos, Esneh, Edfu, Denderah, the Ramesseum, the Memnonium of Abydos, the funerary rooms of Seti I. and the Ramessides of the twentieth dynasty furnish a large quantity of material. Very little remains of the papers of Biot, but the identification of Egyptian with modern stars and constellations by Brugsch (*Thesaurus Inscriptionum Ægyptiacarum*, i., *Astronomische Inschriften*, Leipzig, 1888) are, if not certain, at least very probable. Three mathematical papyri have been found, one at Tanis belonging to Roman times and one from the twelfth dynasty found in the Fayum by Petrie, the third at Thebes by Rhind. The last has been interpreted and annotated by A. Eisenlohr (*Ein mathematisches Handbuch der alten Ägyp-*

ter, Leipzig, 1877). The philosophy of the ancient Egyptians was not at all abstruse or theoretic. It confined itself to the rendition of moral precepts and aphorisms on the conduct of life. Some of these moral papyri are of very ancient date. The *Papyrus Prisse* in the Bibliothèque Nationale de Paris seems to have been written in the twelfth dynasty, and has been termed the "oldest book in the world." It was first analyzed by Chabas in the *Revue Archéologique* (ser. i., tom. xv., 1856), then translated into German by Lauth in the *Sitzungsberichte der Münchener Akademie der Wissenschaften* (1868–70), and into French by Virey (*Études sur le Papyrus Prisse*, Paris, 1887). A duplicate of the text, of a much later date, has been discovered in the British Museum by Griffith, but it still remains unpublished. The dialogue between Ani and Khonshotpou in the Museum of Gizeh, after being interpreted by E. de Rougé in *Les Maximes du Scribe Ani* (Paris, 1872), was edited again with annotations by Chabas (*L'Égyptologie*, tom. i., ii., Paris, 1876–78). Poems and songs are by no means rare in the manuscripts. The remains of two collections of love-songs have been studied by Maspero (*Études égyptiennes*, tom. i.), and the poem on the battle of Kadesh, in which Ramses II. is made to describe how he fought alone against the whole host of the Khitas (Hittites), is widely known outside the circle of professional Egyptologists. E. de Rougé gave it in several French translations, the last in the *Revue Égyptologique*. These versions have been rendered into nearly all the languages of Europe. There was a whole literature of stories akin to the tales of the *Arabian Nights Entertainments*. E. de Rougé discovered the first of them in 1852, and entitled it *A Tale of Two Brothers*; Brugsch in 1867 discovered the *Tale of Satni Khamois*, written in the demotic character, and since then the fragments of about twenty of these Egyptian novels have been published; the most curious among them are the *Tale of the Wrecked Mariner* (Golenischeff, *Sur un ancien conte Égyptien*, Leipzig, 1881) and the *Tale of Khoufoui and the Magicians* (Erman, *Der Papyrus Westcar*, Berlin, 1891). They have been collected by Maspero in his *Contes populaires de l'ancienne Égypte* (2d ed. Paris, 1890), where the analogies they present to similar stories in all parts of the world have been pointed out. Even fables were current in Egypt which the Greeks attributed to Æsop: the fable of *The Lion and the Mouse* (Lauth, *Thierfabel in Ägypten*, Munich, 1868) and *The Dispute of the Stomach and the Members* (Maspero, *Études Égyptiennes*, tom. i.). The demotic papyrus I., 384 of Leyden, contains, among other matters, a dialogue between a jackal, Koufi, and an Ethiopian cat, the general sense of which was indicated by Lauth. Révillout translated some of the most interesting passages into French (*Dialogue entre le petit chacal Koufi et une chatte éthiopienne*, in *Revue Égyptologique*). Private letters have come down, many of them sealed and unopened, others preserved in anthologies, where teachers of the nineteenth and twentieth dynasties had inserted specimens of descriptive and poetical epistles, official reports on administrative subjects, as models of elegant style for the young scribes, their pupils. Several of these collections were published by the trustees of the British Museum in the first volume of the *Select Papyri* (London, 1841–44; the *Papyrus Sallier I.*, the *Papyrus Anastasi II., III., IV., V.*), and others have been discovered in the Museum of Bologna (Lincke, *Correspondenzen aus der Zeit der Ramessiden*, Leipzig, 1878–79). They were analyzed for the first time by Goodwin (*Hieratic Papyri*, in the *Cambridge Essays*, 1856), and a selection of them was translated into French and annotated by Maspero (*Du genre épistolaire chez les Égyptiens*, Paris, 1872). The *Papyrus Anastasi I.*, which contains curious notices concerning the geography of Syria in the time of Ramses II., has been made the subject of a philological and historical work by Chabas, *Le Voyage d'un Égyptien* (Paris, 1866). The demotic manuscripts had been greatly neglected, and very few scholars had published papers on them (Brugsch, *Henry Rhind's zwei bilingue Papyri*, Leipzig, 1865; Pierret, *Préceptes de morale extraits d'un papyrus démotique du Musée du Louvre*, in the *Recueil de Travaux*, i., 1870; Maspero, *Études démotiques*, in the *Recueil*, i., 1870; *Une page du Roman de Satni transcrite en hiéroglyphes*, in the *Ägyptische Zeitschrift*, 1877–80) until E. Révillout made them accessible to the public, and showed the great interest that the private contracts possessed for students of Egyptian law and jurisprudence. (*Chrestomathie démotique*, Paris, 1876–80; *Nouvelle Chrestomathie démotique*, Paris, 1878; *Le procès d'Hermias*, Paris, 1884; *Corpus papyrorum Ægypti*, Paris, 1886–93.) The old Egyptian language has been made the subject of continued research from the days of Champollion's *Grammaire hiéroglyphique*, and all the Egyptologists of note have compiled complete grammars or prepared monographs on various grammatical points. Brugsch's *Grammaire hiéroglyphique* and *Grammaire démotique* and E. de Rougé's *Chrestomathie* have been already noticed, but Birch's *Egyptian Grammar* (in Bunsen's *Egypt's Place*, vol. v.) remains to be mentioned, as well as Le Page-Renouf's *Elementary Grammar of the Ancient Egyptians* (London, 1875); F. Rossi's *Grammatica Copto-Geroglifica* (Torino, 1878); V. Loret's *Manuel de la Langue Égyptienne* (Paris, 1889–93); and above all Erman's excellent treatise on the *Neuägyptische Grammatik* (Berlin, 1880) and on *Die Sprache des Papyrus Westcar* (Berlin, 1889). Lexicography is not so well advanced as the grammar. The *Dictionnaire Hiéroglyphique*, by Brugsch (Leipzig, 1867–82), is not a dictionary so much as an admirable collection of texts and materials for a dictionary. Pierret's *Vocabulaire Hiéroglyphique* (Paris, 1874–79) is but a reproduction on a smaller scale of Brugsch's great work, and S. Levi's *Vocabolario Geroglifico* (Torino, 1887–89) adds but little to our real knowledge of Egyptian words.

The foregoing are some of the necessary works which have been issued in the various branches of the science, but Egyptology owes its constant progress to the incessant publication of notes, papers, and small pamphlets which are inserted year after year in the journals and reviews of Europe, especially the *Transactions* and the *Proceedings of the Society of Biblical Archæology* and the *Memoirs of the Egypt Exploration Fund*, in England; the *Zeitschrift der Deutschen Morgenländischen Gesellschaft* and the *Zeitschrift für ägyptische Sprache und Alterthumskunde*, in Germany; and the *Journal Asiatique*, the *Revue de l'Histoire des Religions*, the *Revue Égyptologique*, the *Recueil de Travaux relatifs à la philologie et archéologie Égyptiennes et Assyriennes*, in France. A complete bibliography of the books relating to Egypt does not exist; the *Bibliotheca Ægyptiaca* of Jolowics (Leipzig, 1858–61) ceased in 1861, and *The Literature of Egypt and the Soudan*, by Prince Ibrahim Hilmy (London, 1886–87), brings the subject down to 1887. A list of the works which have appeared since that time is to be found in the Orientalische Bibliographie (Berlin), founded by A. Müller. G. Maspero.

Ehninger, John Whetton: See the Appendix.

Ehrenberg, ā'ren-bārch, Christian Gottfried, M. D.: naturalist and microscopist; b. at Delitzsch, in Prussian Saxony, Apr. 19, 1795; studied medicine at Leipzig; graduated in 1818; and spent about six years (1720–26) in the exploration of the natural history of Egypt, Arabia, and Syria. Having returned to Berlin, he obtained a chair of medicine in the university of that city. He published in 1828 *Scientific Travels through Northern Africa and Western Asia*, and *Physical Symbols of Birds, Insects, etc.* (in Latin). In 1829 Ehrenberg and Humboldt made an expedition to the Ural and Altai Mountains. Ehrenberg made interesting discoveries with the microscope, and published important works entitled *The Infusoria as Perfect Organisms* (1838) and *Mikro-Geologie* (1854–56). He discovered that cretaceous and other strata of great extent are composed of microscopic organisms. His reputation as an observer is justly great, while the conclusions he has drawn from his observations are frequently faulty. D. in Berlin, June 27, 1876. See the *Life* by Hanstein (Bonn, 1877).

Ehrenbreitstein, ā'ren-brīt'stīn (i. e. honor's broad stone): a fortified town of Rhenish Prussia; picturesquely situated on the east bank of the Rhine; opposite Coblentz, with which it is connected by a bridge of boats (see map of German Empire, ref. 5–C). It stands at the base of a rocky hill. On the summit of this hill stands the citadel of Ehrenbreitstein, situated on a rocky promontory which rises 400 feet above the water, inaccessible on three sides and defended on the N. and only attackable front by a double intrenchment. It contains casemates for the whole garrison, artillery, and stores, and forms the key of the whole fortified position of Coblentz. It has been a fortress from very early times, its origin dating from the time of Drusus, when the Romans erected various castles and strongholds on the Rhine, and a stone bridge over that river at Engers, between Coblentz and Neuwied, where Cæsar is also supposed to have constructed his first bridge. It was besieged without success in 1688 by the French, who took it after a long siege in 1799, and in

1801, after the peace of Lunéville, destroyed the works. The citadel was rebuilt in 1815 by the Prussian general Aster, the projector of all the works at Coblentz. Pop. (1890) 5,281.

Eibenstock, ī'ben-stok: town of Saxony; on railway, 16 miles S. S. E. of Zwickau (see map of German Empire, ref. 5–F). It has manufactures of muslin, lace, chemicals, and tinware. Pop. (1890) 7,166.

Eichberg, īch'bārch, JULIUS: composer and teacher; b. at Düsseldorf, Germany, June 13, 1824; received his first instruction from his father and afterward studied in the Brussels Conservatory. In 1857 he became a resident of New York, and in 1859 removed to Boston, where in 1867 he established the Boston Conservatory of Music. He composed much for the violin, on which he was an excellent performer, but is best known as the composer of the operas, *The Doctor of Alcantara* (Boston, Apr. 7, 1862); *The Rose of Tyrol*; *The Two Cadis*; and *A Night in Rome*. D. in Boston, Jan. 19, 1893. D. E. HERVEY.

Eichendorff, īch'en-dōrf, JOSEPH FREIHERR, von: lyric poet; b. near Ratibor, in Prussian Silesia, Mar. 10, 1788. He studied law at Halle, where he met Novalis, and at Heidelberg, where he became acquainted with the romanticists, Arnim, Brentano, and Görres. Eichendorff himself belongs to the later Romantic school, whose greatest representative he may be considered. His poems (1837) are of an unusual sweetness of melody, tenderness and depth of feeling, and elegance of form. He also wrote several dramas and a number of novels, of which *Aus dem Leben eines Tangenichts* is the best and most widely read. He was by faith a Roman Catholic, and from the standpoint of his faith wrote *Geschichte der poetischen Litteratur Deutschlands* (History of the Poetical Literature of Germany, 1857), which is an interesting and valuable work. See Richard Dietze, *Eichendorff's Ansicht über romantische Poesie* (Leipzig, 1883). D. at Neisse, Nov. 26, 1857. JULIUS GOEBEL.

Eichhoff, īch'hōf, FRIEDRICH GUSTAV: philologist; b. at Havre, France, Aug. 17, 1799; son of a merchant formerly of Hamburg. As a student in Paris he devoted himself particularly to Oriental languages; in 1830 became the king's librarian; in 1842 Professor of Foreign Languages at Lyons; in 1855 inspector-general of the University of Paris. Among his numerous works are *Parallèle des Langues de l'Europe et de l'Inde* (1836); *Études sur Ninive, Persépolis, et la mythologie de l'Edda* (1855); *Grammaire générale indo-européenne* (1867). He aided in compiling a *Dictionnaire étymologique des racines allemandes* (1840; new ed. 1855). D. in Paris, May 10, 1875.

Eichhorn, īch'hōrn, JOHANN GOTTFRIED: German scholar and biblical critic; b. at Dörenzimmern, Oct. 16, 1752; educated at Göttingen; became Professor of Oriental Languages at Jena in 1775. In 1788 he was called to the chair of Oriental and Biblical Literature at Göttingen, which he filled nearly thirty-eight years. He edited the *Allgemeine Bibliothek der biblischen Litteratur* (10 vols., 1787–1801), and wrote numerous works which display an eminent knowledge of Oriental and biblical antiquities. He is noted for having introduced to the German world the famous hypothesis of Astruc (if, indeed, he did not come upon the idea temporarily), and for having produced the first systematic introduction to the Old Testament, *Historisch-kritische Einleitung in das Alte Testament* (3 vols., 1783), which reached a fifth edition. Among his other works are *Einleitung in das Neue Testament* (3 vols., 1804–14); *Urgeschichte* (Primitive History, 2 vols., 1790–93); *Weltgeschichte* (Universal History, 5 vols., 1799–1814); and *Geschichte der Litteratur von ihrem Anfang bis auf die neuesten Zeiten* (6 vols., 1805–13). D. in Göttingen, June 25, 1827. Revised by C. H. TOY.

Eichhorn, KARL FRIEDRICH: jurist and historian; a son of Johann Gottfried Eichhorn; b. at Jena, Nov. 20, 1781; Professor of German Law at Göttingen from 1817 to 1828. He published, besides other works, *Deutsche Staats- und Rechtsgeschichte* (German Political and Legal History, 4 vols., 1808–23; 5th ed. 1843–45). D. in Cologne, July 4, 1854.

Eichler, īch'ler, AUGUST WILHELM: botanist; b. near Ziegenhain, Hessen, Apr. 22, 1839; educated in the University of Marburg; privat docent at Munich 1865–71; Professor of Botany at Gratz 1871–73; at Kiel 1873–78; and at Berlin 1878–87. His numerous published writings are mainly upon systematic botany and the structure of higher plants. For many years he was the editor of *Flora Brasiliensis*, to which he was a frequent contributor. His book on floral structure, *Blüthendiagramme* (1875–78), is a standard work. D. in Berlin, Mar. 2, 1887. CHARLES E. BESSEY.

Eichstädt, īch'stet (Lat. *Aurea'tum*, or *Dryop'olis*): town of Bavaria; on the river Altmühl; about 42 miles W. S. W. of Ratisbon (see map of German Empire, ref. 7–F). It has a Gothic cathedral founded in 1259, a ducal palace once belonging to Eugène de Beauharnais, a public library, a museum, and the castle of St. Wilibald, used as a barrack; also manufactures of hardware, cotton and woolen fabrics, stoneware, etc. The bishopric of Eichstädt was founded here about 745 A. D., and in 1802 became a principality, with the city of Eichstädt as capital. The principality was given to Prince Eugène de Beauharnais in 1817, and dissolved in 1855. Pop. of town (1890) 7,475.

Eichwald, EDWARD: See the Appendix.

Eider: a river of Germany. See the Appendix.

Eider Duck: any one of several species of sea-ducks, especially the European eider (*Somateria mollissima*), which furnishes the eider down of commerce. This duck also occurs in the northern parts of North America, but the common American eider is *Somateria dresseri*, while still another species (*S. v-nigrum*) is found on the Pacific coast. The eider duck is larger than the common duck, and the color of the plumage in the male varies with the changing

Eider ducks.

seasons. The female is of a light reddish-brown color, transversely marked with darker shades. The male displays in spring a very conspicuous pied plumage of sable beneath and creamy white above, with a patch of shining sea green on the head. But he does not acquire this plumage until his third year; before that time it resembles that of the female. The nest is constructed of fine mosses and seaweeds, and the eggs, from five to seven in number, are about 3 inches long and 2 broad, and of a light-green color. During incubation the female deposits in the nest the down which she plucks from her breast, and if this is removed by hunters she furnishes another supply. This down is an important article of commerce. The eggs also are highly prized as food. The northern range of the eider duck is not known. In Greenland, however, it has never been met with N. of the Danish settlements. The Farn islands, off the coast of Northumberland, approximately indicate its southern range. It generally has its haunts on low rocky islets near the coast. In Iceland and Norway it is carefully protected. A fine is inflicted for killing it in the breeding season, and even for firing a gun near its breeding-place. The king eider (*Somateria spectabilis*) is found in great numbers on the coasts of Alaska, Nova Zembla, Greenland, etc., but is rarely seen in Britain or the U. S. proper. Steller's eider and the spectacled eider are well-known species, the former found on the Arctic shores of Europe, Asia, and America, the latter inhabiting the northwest coast of North America. F. A. LUCAS.

APPENDIX.

Cochrane, Rev. WILLIAM, D. D.: b. in Paisley, Scotland, Feb. 9, 1831; educated at Glasgow University, Hanover College (Hanover, Ind.), and Princeton Theological Seminary; ordained in 1859; pastor of the Scotch church, Jersey City, 1859–62, since then of Zion Presbyterian church, Brantford, Ont. In 1874 he founded Brantford Ladies' College, of which he is a governor and lecturer in philosophy. He was moderator of the Presbyterian General Assembly of Canada in 1882, and was a delegate to the Pan-Presbyterian Alliances in Belfast, London, and Glasgow. He has written several religious works, including *The Heavenly Vision* (1873); *Christ and Christian Life* (1875); *The Church and the Commonwealth* (1887); *Memoirs and Remains of the Rev. Walter Inglis* (1887); *Future Punishment* (1888).

Cocos Island: a volcanic island, in the Pacific Ocean, S. W. of Costa Rica, lat. 5° 30′ N., lon. 87° W., with steep rugged coasts and quite level interior. It comprises about 9 square miles, is uninhabited, and is reputed to have been the place of concealment of a large amount of treasure, jewelry, and plate sent there by wealthy inhabitants of the Spanish colonies on the neighboring mainland early in the nineteenth century, during the wars in which they achieved their independence from Spain. The belief that many of these valuables were never recovered led to a number of unsuccessful search expeditions. C. C. ADAMS.

Comba, EMILIO, D. D.: Italian Protestant; b. in San Germano, Waldensian Valleys, Province of Turin, Italy, Aug. 31, 1839; studied at Torre-Pellice and Geneva (under Merle d'Aubigné). He was ordained as an evangelist in 1863, and in 1872 became Professor of Homiletics and of Historical Theology in the Waldensian College, Florence. Besides other scholarly works, he has produced a history of the Waldenses based upon independent research, which combats the favorite theory of his co-religionists that their belief antedates their historic founder, Peter Waldo, of Lyons, in the twelfth century (in French, *Histoire des Vaudois*, Paris and Florence, 1898 *sqq.*). This work supersedes his earlier ones on the same topic. S. M. J.

Commission Agent: in law, generally, any agent acting under a commission, or express order, or authority to do some act for the principal, especially one by which the principal is bound to a contract. Such a commission usually provides what remuneration or pay shall be received by the agent on the performance of his duties as agent, and the term commission is hence also commonly applied to such remuneration, and by a commission agent is usually meant an agent authorized to buy or sell on a commission or reward regulated by a percentage on the sums paid out or received, either by express agreement or by statute. Where there is a usage of trade in the particular business for which the agent is employed, or in the particular place in which the agent is engaged, the amount of the commission allowed to the agent, as to an auctioneer, broker, factor, or the like, is regulated by such usage, in the absence of a special agreement or of a statute regulating the matter. Where there is no such usage, agreement, or statute, the commission, if disputed, must be fixed by the jury or court, as the case may be, at what would be a reasonable reward for the services performed. Executors, trustees, etc., are often allowed commissions by special provisions of statutes, but they are not ordinarily called commission agents. F. S. A.

Commissioner of Assize: in the law of Great Britain, a judge of the High Court or Court of Appeal, or a sergeant-at-law, or queen's counsel holding a commission (called commission of assize) authorizing him to sit at the assizes for the trial of civil actions in each county. The courts held by these commissioners are distinct from the criminal assize courts which are held under commissions of oyer and terminer and commissions of jail delivery. The jurisdiction of the courts created by the commissions of assize is vested in the High Court of Justice by virtue of the Judicature Act of 1873 and the acts amendatory thereof. F. S. A.

Compayré, kom′pā′rā′, JULES GABRIEL: public man, philosopher, and educator; b. in Albi, France, Jan. 2, 1843; studied at the Collège de Castres, the Lycée Louis-le-Grand, and l'École Normale Supérieure; gained the degree of docteur ès lettres at the Sorbonne 1872. In 1865 he was nominated to the professorship of philosophy in the lycée at Pau; he accepted calls successively to the lycée at Poitiers 1868, the lycée of Toulouse 1871, the faculty of letters at Toulouse 1874. He chose as his special field of instruction the philosophy of education, and it is by his work in this field rather than as a philosopher that he is best known in the U. S. In 1880 he took charge of a course in pedagogy in l'École Normale Supérieure d'Institutrices at Fontenay-anx-Roses. He was elected deputy for the arrondissement of Lavaur in 1881, and again in 1885. In the Chamber he took an important part in the discussion of educational questions, especially favoring the measures for compulsory primary education (1882), and for the laicizing of the teaching force (1886). In 1887 he was elected a member of the Conseil Supérieur de l'Instruction Publique, to which he was afterward re-elected. He has published several important works on education: *Histoire critique des doctrines de l'éducation en France depuis le XVI^e^ siècle* (1879, 2 vols.): *Eléments d'éducation civique et morale* (1880); *Histoire de la pédagogie* (1884); *Cours de pédagogie théorique et pratique* (1887); *Abélard and the Origin and Early History of Universities* (first published in English in the Great Educators Series, New York). His *Histoire de la pédagogie*, translated by W. H. Payne, has been widely used in the U. S. as a manual of the history of education. M. Compayré visited the U. S. in 1893. He is the best known in the U. S. of all French educators. At present (1899) he is rector of the University of Lyons, where he takes a leading part in the movement now in progress for decentralizing French education. C. H. THURBER.

Comstock, GEORGE CARY, Ph. B., LL. B.: astronomer; b. in Madison, Wis., Feb. 12, 1855; Ph. B., University of Michigan, 1877; LL. B., University of Wisconsin, 1883; assistant engineer with Corps of Engineers, U. S. A., 1879–80; assistant astronomer, Washburn Observatory, University of Wisconsin, 1881–85; Professor of Mathematics, Ohio State University, 1885–87; associate director and director, Washburn Observatory, since 1887; author of *Method of Least Squares*, and five volumes of *Publications of the Washburn Observatory*.

Congress of Mothers, National: an organization effected in 1897, in Washington, D. C., where it holds annual conventions. Its objects are, in the words of its constitution, "to promote conference among parents upon questions most vital to the welfare of their children; to further develop the manifold interests of the home; to co-operate with educators and legislators to secure the best methods of physical, mental, and moral training of the young; to enlighten motherhood upon all the problems of race development; to uplift and improve the condition of mothers in all walks of life; and to these ends to promote the formation of mothers' and home-makers' clubs in all States and Territories of the U. S." Each mothers' and home-makers' club is entitled to send to the annual convention of this Congress its president or representative and one delegate, and one additional delegate for each twenty-five members after the first twenty-five. Any club or department of another organization pursuing lines of work germane to the objects of the National Congress of Mothers, and which has been approved by the executive committee, is entitled to send one delegate to the annual convention of the Congress.

Consciousness: the fundamental awareness which we have as beings having minds. The mere fact of awareness must be carefully distinguished from all the special functions and activities which go on *in* consciousness. Consciousness is the theater, the common background, the *Schauplatz* of mental events of whatever kind. This is in direct antagonism to the older doctrines of consciousness—an opposition of which modern psychology is fully aware, and upon which it insists. There are certain views long influential in philosophy to which this definition is directly opposed. First, consciousness has been considered a power or activity of the mind. This makes it possible for the mind to put forth more or less consciousness, to use consciousness while the real mind lies in some mysterious way back of its consciousness. This is quite untrue. Consciousness, instead of being a special power or activity, is the common character of all the powers; it is present alike with them all, and is necessary to them. We are equally conscious when we know, when we act, and when we feel. All these take place in consciousness. Second, another older theory makes consciousness an instrument of the mind, a sort of inner eye or glass through which the subject looks in upon mental events, just as it uses the senses to look out upon the world. This too is an error. Instead of perceiving mental events by consciousness, we are directly conscious of them as mental events; the consciousness is the aspect of the events which makes them mental; it underlies and so constitutes the very fact of mentality—this fact of being conscious. Third, yet another theory confuses consciousness with self-consciousness. This too is wrong. Self-consciousness is a higher and more complex thing than consciousness. Children are conscious of their sensations, emotions, etc., long before they become conscious of self. So low animals undoubtedly have consciousness—the simple awareness that changes take place within their minds—without consciousness of a personal self.

Besides all these there is a still more fundamental confusion regarding consciousness which the definition given above aims to meet—a confusion kept alive by writers claiming authority (see Fleming's *Vocabulary of Philosophy*, edited by Calderwood): consciousness is identified with knowledge. Whatever we are conscious of we are said to have knowledge of, and knowledge of greater certainty and value than other sorts of knowledge. This is a confusion of terms. Knowledge is an act of cognition, and involves some mental construction of relations and meanings. Consciousness accompanies knowledge, of course, as it does all the mental functions—indeed, consciousness is the theater in which all acts of knowledge take place; but consciousness is there just the same whether we are performing acts of knowledge, or those of any other function, as feeling and will. To be conscious is simply to have something taking place in the mind. In this sense consciousness is synonymous with a certain usage of the term FEELING (*q. v.*).

Consciousness and the Nervous System (following Baldwin, *Handbook of Psychology: Feeling and Will*):

General Nervous Conditions of Consciousness.—There are two great theories of the physical basis of consciousness: the first (represented by Lewes, Bain, Wundt) holds that the nerve-process, considered in its most general form as irritability, is everywhere conscious. On this view, consciousness is distinguished in a twofold way from the individual circumscribed area of personal experience. In the first place, it is distinguished from *self*-consciousness (see above); and, in the second place, from the vague early consciousness of the child, which exists only in connection with the brain. Each nervous center, each so-called arc, has its own consciousness, and the ordinary consciousness of the individual is only the highest of many that we all possess. The brain-consciousness is the only one we are conscious of, so to speak; but there is consciousness in the spinal cord and in ganglia wherever we find them. The other theory, or class of theories, holds (Maudsley, Schneider, James, Ferrier, and many physiologists) that a given degree of development is necessary before consciousness is found at all. In the development of the system, therefore, consciousness appears only at a certain stage of integration or "upward growth." In the nature of the case, however, it is impossible to disprove consciousness in lower centers.

It also seems true that consciousness represents a condition of slow, difficult, and impeded—consequently of highly developed and well-balanced—integration. The smoothest reflexes are least conscious; the hard-fought decisions are most conscious. It seems likely, therefore, that some degree of inhibition is necessary in the nervous basis—at any rate, for vivid consciousness.

On the other hand, there are considerations which are giving more prominence to the view of Mr. Lewes at present. They tend to show that our distinctions are arbitrary, and open the door at least for presumptive evidence that consciousness is coextensive with nervous reactions. Among these considerations are recent experimental proofs of multiple personalities which may be induced in the same nervous organism in the hypnotic state (Pierre Janet, *Automatisme Psychologique*; see PERSONALITY). The explanation is at least a tempting one, that, the higher centers being inhibited, their conscious content is wanting, and the lower centers supply experience which was before outside the conscious area. Biologists and psychologists alike are recognizing the need of finding consciousness wherever there is life (so Lloyd Morgan, Paulsen, Cope, Minot, etc.). The fact of a possible substitution of function between the brain and spinal ganglia would indicate a possible common element of consciousness. Again, in the scale of animal organisms it is difficult to draw a line denoting the point of nervous complexity below which there is no consciousness.

Particular Conditions.—A further question arises as to the immediate conditions of consciousness in the nervous centers. Given a nervous organism capable of consciousness, on what particular state or aspect of it does the continuous presence of consciousness depend? Here, again, recent views are little more than guesses. The view supported by Herzen (*La Condizione fisica della Coscienza*, reprint from the Proceedings of the Academy of Florence, 1879), seems to have most evidence, i. e., that consciousness arises from the breaking down or expenditure of the cellular structure in the highest centers. In unicellular organisms the analogous process takes place in the nucleus (Verworn). This is concluded from the fact that the attention, a state of concentration and expenditure, is the state of most vivid consciousness; that consciousness is most vague and indistinct when no brain-work is being done, as in cases of *dolce far niente* or diffused attention; that unconsciousness is most nearly reached in sleep and analogous states when all brain-processes have subsided from the lack of sensory stimuli or motor impulse. The chemical results of active thought, increased heat, and organic-waste deposits in the brain, would indicate chemical work and disintegration. Such a theory, however, to be consistent, would have its application only after the organism had attained the requisite development in general structure for the presence of consciousness—if we hold the current theory that consciousness is not co-ordinate with nerve-centers. Perhaps the possibility of applying the present hypothesis of Herzen to nerve-tissue generally may be an additional point of proof of a co-ordination of consciousness and nervous function throughout. It is also true that consciousness depends upon the normal condition of the mechanism as a whole. Any failure in the blood-supply (anæmia) leads to faintness and fainting, and the same result often follows from congestion of blood in the brain (hyperæmia). In general we may say that the healthful activity of the brain, in its normal physiological relations, underlies clear consciousness. It should be borne in mind, also, that all hypotheses as to the conditions in which it arises shed no light on what consciousness is.

Kinds of Consciousness as Dependent on Nervous Complexity. 1. *Passive Consciousness.*—The state of simple passive sensibility. In most cases passive consciousness is, by its very nature, undetected, and it exists as a normal state apart from active consciousness only in lower forms of organic life or in very young children. In adult life we catch it most nearly when just beginning to recover from a swoon; the sounds around us are heard, but have no meaning, relation, or escort. Of this state abstracted from the condition of our usual self-consciousness, we may make the following remarks: 1. It is a state of pure sensibility or simple awareness. 2. It carries no reference to an external object or to the body—that is, no such reference inside consciousness itself. That the nervous process has a direct reference to a particular local stimulus is seen in the particular character of the reaction which follows in each case. 3. It has no reference to self as an object of inner apprehension, no voluntary effort known as "my effort." 4. It has no relational or apperceptive quality. It is not knowledge, but pure feeling. It is the hypothetical affective state in all its purity.

2. *Reactive Consciousness.*—By reactive consciousness is meant the state usually called *involuntary attention*. In

passive consciousness only the reception of stimuli is a matter of sensibility: here consciousness seems to attach to both members of the nervous arc. There is as truly a reaction in consciousness as there is in the nervous system. We may accordingly analyze this form of consciousness for purposes of treatment into three elements, corresponding to the three elements of the nervous arc: first, the receiving consciousness, the stimulus—say a loud unexpected sound; second, the attention involuntarily drawn; and third, the muscular reaction following upon the sound—say flight from fancied danger. The analogy between the typical brain-process and the typical mental process finds here its most general force.

3. *Voluntary Consciousness.*—Voluntary consciousness may be characterized by several new characteristics. It exhibits, first, *deliberation.* By this is meant, in general, a doubleness of sensibility, a consciousness of being drawn apart, or of inward conflict—to limit the case to the feeling aspect, apart from the play of ideas involved. This feeling of deliberation leads on to another element of sensibility, namely, the feeling of decision or *consent*, in which the doubleness spoken of is resolved in a pleasant unity of consciousness again. And further, we find another possible element, apparently distinct from the preceding, the feeling of *effort.* In this sensation there is an active identification of ourselves with the reaction decided upon, a conscious putting forth of ourselves to re-enforce our decision. See WILL.

The results of the exposition may be set forth in a table showing the various aspects of consciousness, with the corresponding functions of the nervous system.

Consciousness	Passive		Automatic	Nervous Function
	Reactive	Apperceptive	Reflex	
		Motor		
	Voluntary		Voluntary	

Properties of Consciousness.—Even in its simplest forms consciousness shows those properties which characterize the developed mind. We find (1) that elementary creatures exercise—that is, they appear to do so—the property of *discrimination*, the ability in some degree to have consciousness of differences in circumstances. This is held by many psychologists to be the germ of the intellectual function in the higher forms. With it appears (2) to go the further property of SENSIBILITY or FEELING (*qq. v.*). The creatures show signs of variations of comfort and discomfort with commotions analogous to what in higher forms is called emotional excitement. Then (3) we find that they act differently, and with great appropriateness and adaptability, upon changes in the environment—the property of so-called *selection.* This in turn is considered the germ of will. With all of these, however, goes (4) that most peculiar of all the properties of consciousness, whatever its degree of development and complexity, its *unity.* Consciousness always has its own way of setting its own boundary, an awareness of the whole-of-itself-at-once, which we call the "unity of consciousness." It is seen in our human experience in the reference to all our experience to a center, the self which experiences; and whether or not we hold with the evolutionists that the higher forms of consciousness arise from the lower, at any rate we may say that without this property of being a unit, as found in the simplest consciousness, the richer sense of self-conscious unity would not be possible.

LITERATURE.—See the general treatises given under PSYCHOLOGY; also Carpenter, *Mental Physiology*; the older authorities given in *Fleming's Vocabulary of Philosophy*; Bastian, *Brain as the Organ of Mind*; Lewes, *Problems of Life and Mind*, 3d Series, 1, 11; Romanes, *Mental Evolution in Animals*, chaps. i.–vii.; Baldwin, *Mental Development in the Child and the Race*, chaps. vii., ix.; and *Dictionary of Philosophy and Psychology*, arts. *Consciousness* and *Feeling.* J. MARK BALDWIN.

Converse, CHARLES CROZAT: b. in Warren, Mass., Oct. 7, 1832, and studied music in Boston; went to Europe in 1855 and studied in Leipzig; in 1857 settled in Erie, Pa., where he has since remained, practicing law, but still following a musical career. His compositions are largely in manuscript. They include two symphonies, several overtures, string quartets and quintets, and much vocal music, both secular and sacred. His *Fest Overture* was performed by the Brooklyn Philharmonic Society in 1870. He published some compositions under the pseudonym of *Karl Reden.* D. E. H.

Cook, FRANCIS AUGUSTUS: naval officer; b. in Massachusetts, May 10, 1843; entered the Naval Academy in 1860, was promoted ensign Oct. 1, 1863, and was attached to the Seminole of the Western Gulf blockading squadron for two years. He was assigned to the Vanderbilt of the North Pacific squadron in 1865, and was commissioned master May 10, 1866. The next year he was assigned to the North Atlantic squadron. He was commissioned lieutenant Feb. 21, 1867, and lieutenant-commander Mar. 12, 1868. In 1869 he was assigned to duty at the Naval Academy, was on the Saranac of the Pacific fleet the following year, and on the receiving ship Independence in 1872. For the next two years he served on the Richmond, flagship of the South Pacific station, then on the receiving ship Sabine, and on the Plymouth of the North Atlantic station 1876–78. In 1880 he was stationed at the Naval Academy for three years, being promoted commander Oct. 12, 1881. He was lighthouse inspector 1883–86, and commanded the Ranger 1886–89. He was inspector of ordnance at the Boston Navy-yard 1890–93, and then for three years in the Bureau of Navigation. He was promoted captain Feb. 28, 1896, and was put in command of the Brooklyn Dec. 1 of the same year. In the war with Spain in 1898 he took part in the blockade of the Cuban ports, and was engaged in the battle of July 3, off Santiago. In 1899 he became a member of the examining and retiring board.

Copinger, WALTER ARTHUR, LL. D., F. S. A., F. R. S. A.: English jurist; b. in 1847; was called to the bar at the Middle Temple; has held many honorary positions, including that of president of the Biographical Society and of the Manchester Law Library Society, and is now (1899) Professor of Law in the Owens College and Victoria University. Has published *Index to Precedents* (1872); *Title Deeds* (1875); *An Essay on the Abolition of Capital Punishment* (1876); *The Law of Rents* (1886); *The Law of Copyright* (3d ed. 1891); supplement to Hain's *Repertorium Bibliographicum*; and other minor books, including *A History of the Copingers or Coppingers*; a *Treatise on Predestination, Election, and Grace*, etc. F. S. A.

Coppermine River: a river of Canada; runs through the western part of the Barren Grounds. Crossing the Arctic circle at about lon. 114° W., half of its course is within the polar zone. It empties into the Arctic Ocean, S. of Wallaston Land. It is about 360 miles long, and its valley is the northern continuation of that of Yellow Knife, affluent of Great Slave Lake. It derives its name from the native copper collected along its banks. Dr. G. M. Dawson, of the Geological Survey of Canada, said in 1888 that there was every reason to believe that rocks similar to those containing copper at Lake Superior occur along the river. On account of stories told by Indians and trappers as to its mineral wealth, the Hudson Bay Company in 1770 sent Samuel Hearne to the river to learn where the copper was procured; but though he reported finding copper, his book and map were unscientific and unreliable. Dr. Richardson in 1826 found the lower 40 miles full of rapids, and the river impracticable for boats drawing more than a few inches. The region has not yet been well explored. C. C. ADAMS.

Coppinger, JOHN J.: soldier; b. in Ireland in 1835; served in the Papal Guards in Rome. He came to the U. S. at the beginning of the civil war and obtained a captain's commission in the U. S. army in 1861. He was wounded in the battle of Bull Run, and in the course of the war he fought in twenty battles. He was made colonel of the Fifteenth Cavalry in 1865, was soon afterward honorably mustered out, and immediately transferred to the Twenty-third Infantry. He became major in 1879, and lieutenant-colonel of the Eighteenth Infantry in 1883. He was breveted for gallantry during the civil war and for bravery in fighting the Indians. He was commissioned brigadier-general in 1887. In the war with Spain he was sent to Puerto Rico in command of the Fourth U. S. Army Corps. On Oct. 11, 1898, he was retired as brigadier-general of the regular army on account of age.

Corbett, JULIAN STAFFORD, LL. D.: lawyer and author; b. in Surrey, England, Nov. 12, 1854; received his education first at Marlborough and later at Trinity College, Cambridge; was called to the bar in the Middle Temple in 1877, and practiced as a barrister until 1882, when he devoted his attention chiefly to literary pursuits, writing for the standard periodicals: was special correspondent for the *Pall Mall Gazette* for the Dongola expedition 1896. His writings include romances entitled *The Fall of Asgard, For God and Gold, Kophetua XIII., A Business in Great Waters*, etc., and sketches of the lives and doings of Monk and Drake in the work entitled *English Men of Action*, and a short story of *Drake and the Tudor Navy.* F. STURGES ALLEN.

Cormorant: A large, flightless cormorant, which has been named *Phalacrocorax harrisi*, was discovered on Narborough island of the Galapagos group in 1898. It exceeds in size any known recent species, and is extremely rare, but nine individuals having been seen. The specimens obtained were secured with great difficulty, as the birds frequent places where there is much surf. It is quite probable that the species will soon be exterminated. F. A. Lucas.

Coro'nium: a chemical element. During 1898 Prof. Nasini, of Padua, Italy, while investigating chemically the gases emanating from the earth in various parts of Italy with the object of detecting the presence of argon and helium, and possibly of other elements that they might contain, found in the spectrum of gases from the Solfatara di Pozzuoli a sufficiently bright line with the wave-length 531·5, corresponding to that of corona 1474 K, attributed to coronium, an element not previously discovered, and which should be lighter than hydrogen. This line had never before been discovered in earthly products, and had only been observed in the solar corona. Coronium would seem to be a substance with a vapor density far smaller than that of hydrogen, which is the lightest body with which we are familiar. This discovery, confirming the results of spectroscopic examination of the sun, is another proof of the identity of materials in the sun and the earth. M. B.

Corporal Punishment: punishment inflicted on the body. In the U. S., as a general rule, corporal punishment in schools is going out of vogue. In many places it is not allowed at all; where still tolerated the practice is greatly restricted by rule. In European countries the feeling against corporal punishment is not so strong as in the U. S. As a rule, the better the schools the milder the punishment. Horace Mann justified corporal punishment as a necessity on account of the heterogeneous character of the attendance and the lack of training on the part of the teachers. The question of school punishment is confessedly one of the most difficult with which teachers have to cope. Those who believe in and practice corporal punishment have a single, simple, and effective prescription to cure all ills. So far as mere police duty is concerned, corporal punishment meets all requirements, but from the point of view of moral training it is most inadequate. When administered all care must be taken not to injure the victim permanently. Careless blows on the head are always dangerous. Pulling the hair, ears, etc., are cruel amusements, not educative punishments. There is only one safe manner in which to apply corporal punishment. See Herbert Spencer's *Education* for his theory of natural punishments; Horace Mann's lecture on *School Punishments* for a defense of corporal punishment; and for discussions of school punishments in general, Rein, *Outlines of Pedagogics*; Thring, *Education and School* and *Theory and Practice of Teaching*; Tompkins, *Philosophy of Teaching*; Page, *Theory and Practice of Teaching*; White, *School Management*. C. H. Thurber.

Coudert, koo'dãr', Frederick René, LL. D., J. U. D.: b. in New York, Mar. 1, 1832; received his early education at his father's school in New York city; graduated at Columbia College 1850, and was admitted to the bar in New York city in 1852; one of the persistent opposers of the Civil Code of the State of New York; president for a term of the Association of the Bar of New York city. He has written largely for leading periodicals, and is a prominent and eloquent public speaker; is an active Reform Democrat, and was one of the committee appointed to go to New Orleans to secure a fair count of the vote of Louisiana during the Tilden-and-Hayes campaign; was one of the most prominent members of the so-called anti-snap organization, which was chiefly instrumental in causing the nomination of Grover Cleveland for President in 1892; was of counsel for the U. S. in the Bering Sea controversy before the board of arbitration in Paris; was for ten years president of the Benevolent Society of New York, the first president of the U. S. Catholic Historical Society, and has held many other positions of responsibility; is a Knight of the Legion of Honor of France, an officer of the Crown of Italy, and an officer of the Order of Bolivar of Venezuela. F. Sturges Allen.

Coville, Frederick Vernon: botanist; b. in Preston, N. Y., Mar. 23, 1867; educated at Oxford Academy, graduated at Cornell University in 1887, and held the appointment of instructor in botany there in 1887–88. During the summer of 1887 he was assistant in botany on the Geological Survey of Arkansas, a year later became assistant botanist in the U. S. Department of Agriculture in Washington, and was advanced in 1893 to the head of the department, which place he still holds. Mr. Coville has made extensive botanical explorations and investigations in the western part of the U. S., and served in 1890–91 as botanist of the Death Valley expedition. He is a member of various scientific societies, and was chosen secretary of the section of botany of the American Association for the Advancement of Science in 1893, and in 1899 was elected president of the Biological Society of Washington. His published papers have been for the most part contributed to official reports, and include the following: *Catalogue of the Plants of Arkansas* (Little Rock, 1891); *Botany of the Death Valley Expedition* (Washington, 1893); *Our Public Grazing Lands* (1897); and *Forest Growth and Sheep Grazing in the Cascade Mountains of Oregon* (1898). Marcus Benjamin.

Cox, Palmer: author and artist; b. in Granby, Quebec, Canada, Apr. 28, 1840; educated at Granby Academy, and after graduation resided in Springfield, Mass., and Lucknow, Ontario, until 1863, when he went to California. From 1863 to 1875 he wrote stories and drew cartoons for San Francisco periodicals, and in 1875 settled in New York and devoted his whole time to literary and artistic work, the latter chiefly in illustrating his own writings. Among his works are *Squibs of California* (1874); *Hans von Pelter's Trip to Gotham* (1878); *How Columbus Found America* (1878); *That Stanley* (1878); *Comic Yarns* (1888); *Queer People* (1888); and the "Brownie Stories," *The Brownies, their Book*, *Another Brownie Book*, *The Brownies at Home*, *The Brownies Around the World*, *The Brownies Through the Union*.

Cox, William Van Zandt: administrator; b. near Zanesville, Ohio, June 12, 1852; son of Col. Thomas J. Cox, who had charge of the Quartermaster's Department for the Armies of the Cumberland and Tennessee in Nashville during the civil war, and a nephew of S. S. Cox, who for many years was a member of Congress. As a boy he was with his father in Nashville, under whom he served as an orderly, and later graduated at the Ohio Wesleyan University in 1874. He studied law in Zanesville and was admitted to the bar in 1877, but relinquished his practice in 1878 to accept an office in the Ohio Senate. In 1879 he went to Washington and entered the service of the U. S. National Museum, of which in 1886 he became chief clerk and executive officer, an office that he has since held. In addition to his regular duties he has been prominent in connection with various expositions, serving in 1883 as secretary and disbursing officer to the International Fisheries Exposition in London. He represented the Smithsonian Institution at the Minneapolis Exposition in 1887, and also at the celebration held in Marietta in 1888 in honor of the centennial anniversary of the inauguration of General St. Clair as Governor of the Northwest Territory. He was the financial officer of the Smithsonian Institution and U. S. National Museum at the World's Fair held in Chicago in 1893, and served in a similar capacity to the Cotton States Exposition, held in Atlanta, Ga., in 1896. Later he was chosen to be the secretary and executive officer of the Government board of management at the Tennessee Centennial Exposition, held in Nashville in 1897, and also filled a similar office in connection with the Trans-Mississippi Exposition, held in Omaha in 1898. Mr. Cox has been vice-president of the Sons of the Revolution and also of the Sons of the American Revolution in the District of Columbia, and to their publications has contributed historical papers. Besides his various official reports he is the author, with H. M. Northrup, of the *Life of Samuel S. Cox* (Syracuse, 1899). Marcus Benjamin.

Crafts, James Mason, LL. D.: chemist; b. in Boston, Mar. 8, 1839; graduated at the Lawrence Scientific School of Harvard in 1858; spent a year in post-graduate study there and went in 1859 to Freiberg, Saxony, where he studied mineralogy and mining engineering, and thence passed to Heidelberg, where he came under the influence of Bunsen, whose assistant he became. From 1861–64 he was a student in Paris under Wurtz. He returned to the U. S. in 1865, and for a year devoted himself to the study of mines in Mexico and California. In 1867 he was called to Cornell University, and as dean of the chemical faculty organized the chemical department, and planned and equipped the laboratory in Ithaca. He was called to the chair of chemistry in the Massachusetts Institute of Technology in 1870, and held that place until 1874, when failing health compelled him to go abroad. His name, however, was retained

among the faculty as non-resident professor until 1880. During the years 1874 to 1891 he devoted himself to chemical and physical researches at the École des Mines in Paris, where in collaboration with Friedel he investigated the ethers of silicon and the compounds of that element with other organic radicals, the reactions of aluminium chloride with a large number of substances, and the density of halogens at high temperatures. It was at this time that he became the inventor of a special form of hydrogen thermometer, and, in recognition of the merit of his method of reducing the inaccuracies of mercurial thermometers by preventing the slow displacement of their fixed points, he was awarded the Jecker prize of 2,000 francs by the French Academy of Sciences, and made a Chevalier of the Legion of Honor by the French Government. In 1891 he returned to the Massachusetts Institute of Technology and continued his chemical and physical investigations, becoming later the head of the department of chemistry in that institution. He was chosen chairman of the faculty in January, 1898, and in the autumn of that year president of the institute. The degree of LL. D. was conferred upon him by Harvard in 1898, and since 1872 he has been a member of the National Academy of Sciences. He is a corresponding member of the British Association for the Advancement of Science, and a fellow of the American Association for the Advancement of Science. Besides publishing the results of his investigations and researches in the *Proceedings* of various societies of which he is a member, he is the author of a text-book on *Qualitative Analysis* (New York, 1869), of which six editions have been published. M. B.

Craig, Oscar John, Ph. D.: educator; b. in Madison, Ind., Apr. 18, 1846; A. B., De Pauw University, 1881, and A. M. 1883; Ph. D., Wooster University, 1887; superintendent of schools, Sullivan, Ind., 1881–84; principal of preparatory department of Purdue University 1884–87; Professor of History and Political Economy, Purdue University, 1887–95; president of the University of Montana since 1895. He is author of *Omatonon, a Study in Early Indiana History*, *The Bible in the Nineteenth Century*, and various magazine and review articles.

Craik, Robert, M. D., LL. D.: b. in Montreal, Canada, Apr. 22, 1829; graduated at McGill University in 1854, and became house surgeon of the Montreal General Hospital. In 1856 he was made demonstrator of anatomy in McGill University, in 1859 curator of the museum, in 1860 Professor of Clinical Surgery, and in 1867–69 was Professor of Chemistry. He became known as a successful ovariotomist when such operations seldom succeeded. He is said to be the first writer to assert, in the *Montreal Medical Chronicle* for Sept., 1854, an origin in specific cells or germs for infectious diseases.

Crane, Stephen: novelist; b. in Newark, N. J., Nov. 1, 1871. He received education in Newark, and at Lafayette College, Easton, Pa., breaking off his course at the latter place, at the age of 16, to become a newspaper reporter. In 1896 he published *The Red Badge of Courage*, a story of the civil war, which was widely read, and instantly gave him first rank among realistic writers. On his way to Cuba in 1897 he was shipwrecked and narrowly escaped death. During the Spanish-American war in Cuba he reported incidents for the New York *Journal*. Other published books of his are *Maggie: a Girl of the Streets* (1896); *George's Mother* (1896); *The Little Regiment* (1897); *The Third Violet* (1897); *The Open Boat* (1898); *The Eternal Patience* (1898); *Wounds in the Rain* (1900); and *Great Battles of the World* (1901). D. in Badenweiler, Germany, June 5, 1900.

Craven, Tunis Augustus Macdonough: naval officer; b. in Portsmouth, N. H., Jan. 11, 1813. He entered the Naval Academy in 1829, and after service on different vessels was attached to the coast survey; became lieutenant 1841; was afterward connected with the Pacific squadron, and took part in the conquest of California; was again associated with the coast survey 1849; commanded the expedition for surveying the Isthmus of Darien by way of the Atrato River for a ship-canal, 1857; in command of the Mohawk he coasted Cuba for the purpose of intercepting slave-ships, one of his captures being a vessel transporting 500 negroes, who were liberated and returned to Africa. The Queen of Spain presented him with a gold medal and other honors for gallantly saving the crew of a Spanish merchant vessel, and his wife was the recipient from the New York board of underwriters of a silver service of plate for his efficient aid to American merchant vessels. In command of the Crusader, at the commencement of the civil war, he was instrumental in defending from capture the fortress at Key West. Having been advanced to commander, and ordered to the Tuscarora, he engaged in searching for Confederate cruisers, and successfully blockaded the Sumter so long at Gibraltar that she was deserted by her crew. After brief service in the James River flotilla, he was attached to Farragut's squadron, off Mobile, his ship, the Tecumseh, being given the post of honor, and in the subsequent engagement firing the first shot. Here, in pursuing the Confederate ram Tennessee, Aug. 5, 1864, he ran upon a line of torpedoes, losing his vessel, his own life, and the lives of nearly all of his crew. It is related that as the Tecumseh was sinking he met his pilot at the foot of the ladder of the top turret, as both sought a place of safety; conscious of the fact that the pilot was not to blame for the fatal course taken, the commander stepped aside, saying, "After you, pilot." He has been called "the Sydney of the American navy."

Creighton, James Edward, Ph. D.: educator; b. in Pictou, Nova Scotia, in 1861; prepared for college in Pictou Academy; A. B., Dalhousie College, 1887; graduate student at Cornell University and University of Berlin; Ph. D., Cornell University, 1892; principal of academy, North Sydney, Nova Scotia, 1887–88; fellow in Cornell University 1888–89; instructor in philosophical department, Cornell, 1889–91; Associate Professor of Modern Philosophy, Cornell, 1892–95; Sage Professor of Logic and Metaphysics, Cornell, since 1895; author of *An Introductory Logic* and *The Will and its Mode of Action*; translator (with E. B. Titchener) of *Wundt's Human and Animal Psychology*; contributor to *The Philosophical Review*, *Kant-Studien*, etc.; co-editor of *The Philosophical Review*; American editor of *Kant-Studien*.

Crevaux, Jules, Dr.: a French naval officer; b. at Lorquin, 1847. His explorations in South America in 1876–82 were extensive, brilliant, and most painstaking. He was engaged in 1876–78 in exploring and mapping the river systems of French Guiana. He began his work in the upper Amazon basin in 1879, and was the first to follow the Içá river almost to its sources in the Colombian Andes, from the slopes of whose volcanoes it carries masses of pumice to the Amazon. He descended the Yapura to the Amazon, and threw considerable new light upon the hydrography of the northwest part of the great basin. He transferred his labors to the northwest (1880–81), ascended the Magdalena, crossed the Cordilleras, and descended the Guaviare to the Orinoco, and found that its extent of navigable waters was about equal to that of the main river. He then undertook the perilous mission of exploring the Pilcomayo tributary of the Paraguay river, known at its sources and its mouth, though the hostility of the Indians had defeated all attempts to trace its entire course. He followed the river from its source in Bolivia to its middle course, where he and nearly his entire party were massacred (Apr. 27, 1882) by the formidable Tobas. His specialty was the exploration of rivers, and his reports were full of fresh information; but, as all his life as an explorer was spent in the field, he had no time to record his travels in book form. C. C. A.

Criminology [from L. *crimen*, gen. *criminis*, crime, and Gr. λόγος, reason, discourse]: in general, the science of the study of crime. In particular, however, the term criminology is used to designate criminal anthropology, or that branch of sociology which treats of those actions of men which are commonly considered criminal, together with the causes of crime, the methods of correcting or preventing it, etc., and, in short, aims to do for the criminal what anthropology does for man in general. Criminology is one of the most recently developed sciences, and the first international congress to consider it was held in the year 1885 at Rome, in Italy. This congress for criminal anthropology, which consists almost entirely of university professors, jurists, and scientific specialists, is to be sharply distinguished from the international congress for prison and penitentiary systems, consisting almost entirely of prison wardens and others who have had to do with the practical side of the prevention and repression of crime.

At the time of this first congress the scientific study of criminology (or the study of the relations of criminals to society and the investigation of the causes of criminal conduct and of the proper methods of treating criminals, a correct plan of punishment of crime, and the true or best method of reforming criminals) was looked upon as purely theoretical and of no practical value, and the science is

still in its infancy, so far as practical results are concerned.

The "Schools" of Criminology.—The father of criminology, as he might well be called, is Cesare Bonesana Beccaria, an eminent Italian economist and writer on penal laws, who published, in 1764, a treatise on crimes and their punishments, in which he advanced eloquent arguments against the severities and abuses of the then existing criminal law. This work met with much admiration, was widely read, and was translated into many languages; it is the foundation of the modern "classical school" of criminology, so called. The purpose this school had, and still has, was a practical one; that is, to diminish the severity of all punishments, and to abolish some of them by bringing about a humanitarian reaction against the arbitrary harshness of the punishments of mediæval times. It studied crime by a method of its own, looking upon crime as an abstract entity dependent upon the law.

There have been several offshoots from the theory of Beccaria, among which is the so-called "correctional school" of criminology, holding that the chief object of the punishment of criminals is the reformation of the criminal. This school, which was brought into prominence by Roeder, and flourished in Germany, and to a less extent in Spain, Italy, and France, no longer has an independent existence, although all schools recognize the principle that punishment ought to have a reforming effect upon the criminal.

Practically speaking, the classical school has up to within a very few years stood alone, with varying shades of opinion, but with one distinct method, and a distinct and well-defined body of principles and consequences derived from them. As a result of its labors, in most of the penal codes there has been a large, and in some cases an excessive, diminution of punishments; and the followers of the school have written many works of great importance and weight, among which are Carara's *Programme of Criminal Law*, in which crime is stated to be "a fact dependent upon law, an infraction rather than an action." These schools have in turn largely given way to the so-called "positive school" of criminology, which now receives the most public notice, and has for its object and means the experimental study of the pathological phenomena of the social body. It aims primarily and fundamentally to study the natural growth of criminality in the criminal, and the social and psychical conditions of his life, so as to discover the most effectual remedies for the removal of the causes of crime, as well as the best means of reforming the criminal.

Scope of the Science of Criminology.—The study itself of criminology proper is now commonly divided into general, special, and practical criminology. *General criminology* may be said to consist in a summary and synthesis of all the facts known relating to the science, or a general treatment of the entire subject. *Special criminology*, as the name implies, is taken up with the investigation of special subject-matters, that is, individual cases, physically, psychically, and historically considered. This field affords one of the chief avenues or means by which progress in the study and the application of the science is to be made, and upon its conclusions is based *practical criminology*, which includes all of the methods and institutions for the prevention or repression of crime, and which is the branch of the study of criminology most familiar to the public and appealing most to the public mind.

The various subjects or branches of general criminology may be broadly classified as the *embryology* of crime, that is, the analogies of crime in the vegetable and animal kingdoms; the *anatomy* of criminals, including the craniology, cerebrology, histology, anthropometry, and physiognomy of the criminal (this branch of criminology affording one of the most striking and beneficial results of the modern study of criminology, that is, the Bertillon system of measurements for identification of criminals): criminal *psychology*, or the study of the psychical life of criminals, including their intelligence, sentiments, sensibilities, ethics, æsthetics, and religion: criminal *sociology*, which comprehends the association together of criminals, and their relation to the state, both economically and in connection with their own welfare; criminal *jurisprudence*, or the study of criminal laws, and the principles on which they are based; criminal *penology*, treating of the principles, degrees, and methods of punishment of criminals; *statistical criminology*, having for its object the arrangement, classification, and summary of all criminal data, and the deduction from them of the conclusions which they warrant; criminal *hypnology*, which treats of the hypnotic conditions, or partially hypnotic conditions, in which the crime is or may be committed, especially in the case of hysterical persons; criminal *epidemiology*, which treats of the imitation or springing up of crime by a sort of contagion (this feature in the occurrence of crime being especially noticeable, having lately been forcibly shown by studies of criminal statistics, which have proved that in the case of any specially atrocious or conspicuous crime being committed, other similar crimes are committed immediately after it in unusual frequency, the explanation being that the widespread publicity given to the crime through modern newspaper channels suggests a similar crime to those who are in such a condition of mind and surroundings as to need only the suggestion to occasion the commission of the crime); criminal *teratology*, treating of the pathological sexuality of the criminal; criminal *prophilaxy*, having to do with the methods of prevention of crime and the reformation of the criminal through alteration of social conditions, by means of education—physical, intellectual, moral, and religious—and by means of prisons, transportation, deportation, etc.; and lastly, criminal *philosophy*, which takes up and discusses the disputed questions and theories of criminology, such as atavism, infantilism (or natural depravity of children), degeneracy, the correct significance of psychical characteristics, etc.

Purpose and Method of the "Practical School."—The purpose of the modern positive or practical school of criminology is to make an experimental study of social pathology, as regards criminal symptoms, in order to bring the theories of crime and punishment into harmony with everyday facts. Its method is to study the natural growth or origin of criminality in the criminal and the physical and social conditions of his life, so as to apply the most effectual remedies to the different causes of crime.

This scientific study of the criminal means that first, in general, there are noted and carefully studied his name, age, country, profession, and civil state; and in addition other points are carefully noted, by making an anthropometrical examination, noting the development of skeleton and muscular system; color; tattooing; craniometry, including measurements of face, height, bizygomatic diameter, facial type, facial index; characteristics of the nose, teeth, eyes, neck, lungs, thorax, heart, and genital organs; disfigurements. An examination of sensibility, noting touch; sensibility to the electric current of the hands and the tongue; sensitiveness to æsthesiometer; algometrical sensitiveness; muscular, topographic, thermic, meteorological, magnetic, metallic, hypnotic, acoustic, and chromatic sensibility, etc.; first sensual relations; anomalies. An examination of motility, noting voluntary movements in gait, speech, language, writing; muscular force: manual skill, etc. An examination of vegetative functions, noting circulation; respiration; thermogeny; digestion; secretions, saliva, sweat, etc. A physical examination, noting perception; ideation; reasoning; memory, will, intelligence (works, writings); slang; conscience; sentiments (moral and religious); passions; instincts; moral sense; habitual expression of face; psychometry, etc. An anamnestic examination, noting particulars as to family, parents, history (diseases and crimes of parents), precedents (including education, instruction, political development), diseases, traumatic accidents, crimes, habitual character, occupation preferred, last crimes, repentance, admissions, nervous diseases, and mental anomalies.

The organic constitution of the criminal, as so studied, comprises anomalies of the brain and other vital organs, and nerve-sensibility, including reflex activity and all the other bodily characteristics taken as a whole, such as physiognomy, tattooing, etc.

The mental or psychical constitution of the criminal, as so studied, comprises the make-up of his mind as regards intelligence, feeling, moral sense, and the special criminal characteristics of handwriting and slang.

The personal characteristics include his purely biological conditions, such as race, age, sex; and his biosocial conditions, such as civil status, profession, domicile, social rank, instruction, education, etc.

The physical factors of crime itself are climate, the nature of the soil, relative length of day and night, length of the seasons, average temperature, meteoric conditions, agricultural or professional pursuits, etc. The social factors comprise density of population, public opinion, family circumstances, systems of education, industrial pursuits, alcoholism, economic and political conditions, the administra-

tion of justice, policing, and in general legislative and penal institutions. Upon these various things depend the frequency and nature of the crimes committed in any community.

The principles and tendencies of this school of criminal anthropology may be outlined as follows:

1. The renunciation of the law of retaliation and punishment, substituting for it the purpose of moral reclamation of the criminal or his separation from society.

2. In addition to the study of the effect of crime, the consideration of the criminal himself, the definition of the causes which produce crime, the study of the sphere of action of the criminal, and the measures to be taken for the safety of society against his acts, the analyzation of the criminal according to purely scientific results, with the aid of exact methods which are applied to the investigation of all scientific phenomena, as distinguished from the study of the criminal in the abstract and speculation over his guilt or responsibility.

3. The observance that in crime the results of two factors reciprocally react: first, the individual peculiarities arising from the nature of the criminal or his psychic and physical organization, and next the peculiarities of external influence, as climate, nature of country, and social surroundings.

4. Criminology relies upon exact results, and shows the criminal to be an organization more or less unfortunate, vicious, impoverished, ill-balanced, defective, and ill-adapted to struggle successfully with surrounding conditions, and consequently incapable of maintaining this struggle in legally established ways. It shows that this defect of adaptation is not absolute for the majority of criminals, but varies with their conditions.

5. The causes of crime are of three classes—immediate causes, which arise from the character of the criminal; those more remote, which arise in unfavorable surroundings, under the influence of which the criminal's organic peculiarities are developed into more or less constant tendencies or agents; and predisposing causes, which push this ill-proportioned and viciously developed organization toward crime.

6. Basing crime upon these scientific grounds, criminology has for its fundamental purpose the study of the actual criminal and his crimes as scientific phenomena to be investigated throughout their length and breadth from their beginning to their final development. Thus the phenomena of crime are closely akin to all of the great social questions.

7. Further, criminology logically recognizes an absence of good sense in repressive measures determined in advance as to their duration and specific character, and affirms the necessity of studying individual peculiarities before rendering decisions. The term of punishment should endure as long as the causes exist which necessitated it. It should cease as soon as the causes cease.

8. Those members of the community who are intrusted with the making and enforcement of criminal laws should receive a special training for that purpose, and the laws regulating criminal acts and punishment in the community should be based upon enlightened knowledge furnished by modern criminology, recognizing the rights of the criminal, the reformatory object of the law, and the scientific method of reformation.

Conclusions of Criminology.—The classical school divides crimes into ordinary and political, ordinary crimes being those which are recognized as offenses against the general law of morality, and political crimes those acts, in contravention of arbitrary laws, which in themselves have no moral quality. The positive school, however, maintains that we should not distinguish between ordinary and political crimes, but between criminals, whether ordinary or political, according to their motives. It is now generally recognized that just what crime is depends more upon time, place, and nationality than upon any intrinsic merit or demerit in the act performed.

The kind of crimes which formerly consisted in the revolt against the restraints of government have now nearly disappeared with the removal of individual restraints. The criminals of to-day are mostly those who can not properly use the freedom which they enjoy, and the purpose and aim of modern positive criminology is so to influence those weaker classes, by restraints, removal of temptation, and educative influences, that they shall be kept from falling into criminal actions. The value and proper use of education as a preventive of crime is far from agreed upon.

In 1870 an investigation of seventeen States of the U. S. showed eight times as many criminals from the illiterate stratum of the population as from an equal number of the population who could read and write. This investigation includes 110,000 prisoners. A recent study undertaken by the U. S. Bureau of Education shows that in the thirty prisons reporting for 1888 three and one-fourth times as many criminals came from the illiterate as their proportionate quota allowed; but the conclusions to be drawn from such statistics are not well settled.

The phases of crime are changed by the growth of modern inventions, and by changes in society and in the laws. Thus, the crime of piracy has been nearly done away with by the use of steam in navigation. Murders on railways, once common, are now rare; and the old highway robberies which were committed in the days of diligences and stage-coaches have nearly disappeared with the substitution of railways for the obsolete conveyances.

It is also still an unsettled dispute whether the tendency of modern times is toward the increase or decrease of crime. One school or party maintains that crime is on the increase considering the proportion of crimes to the population; and the other school maintains that crimes are on the decrease, but that, by reason of the more perfect record now kept of criminal acts and of the increased number of statutory crimes, and the greater number of crimes detected, the increase in crimes noted in the statistics is superficial only.

It has been noted that the number of crimes committed varies with the physical changes of climate. Thus, in cold weather the crimes against property become more frequent, and in hot weather the crimes against the person. In a season of drought or famine crimes against property increase. In a season of plenteous crops, especially wine products, crimes against the person increase. The so-called law of criminal saturation is one which looks upon the community as constantly containing individuals who are on the verge of the commission of crime, and who by any criminal suggestion, or any slight added inducement, would be driven or carried over into the ranks of the criminal classes.

One of the most important features of modern reform in criminal punishment is the separation of habitual offenders from those who are only occasional or chance offenders. Modern criminology has proved that the present system as at present administered is practically maintaining an enormous number of schools for the instruction of citizens in the commission of crime, by forcing the occasional criminal (such as a man who commits a murder or assault, or other crime in the eyes of the law, through some special provocation, without any criminal instincts or characteristics predominating in his general character) with the habitual criminal, whose profession is the commission of crime, or who habitually and intentionally commits criminal acts.

In the penal code of the German Empire, Ellero reckoned 203 crimes and offenses. The Italian code of 1859 enumerated about 180, the new code about 200, the French penal code about 150, and it has been estimated that the kind of crimes committed by habitual criminals is only about one-tenth of the complete list of crimes in a legal classification. The crimes most frequently committed by habitual criminals are thefts, vagrancy, homicides, swindling, forgery, rape, conspiracy, and incendiarism.

The study of criminology has shown that increasing the severity of the punishment does not necessarily decrease the number of crimes. The tendency is to lay more stress on certainty of punishment than on the rigor or severity of it.

Another feature of modern criminological reform is the indeterminate sentence, so called, in which, instead of a sentence for a fixed period of hard labor or confinement being imposed for a given crime, the length of the sentence is left to the discretion of the judge or is contingent upon the conduct and behavior of the criminal, providing for his release subject to good behavior.

Work has been proved to be, in criminal as well as in lunatic asylums, a better means of order and discipline than chains and castigation. More reformation is accomplished by inducing prisoners or criminals to cultivate their self-respect and interest than by threats and restraint, and the orderly habits and healthy feeling of occupation induced by work have been found a great aid to this end.

Isolation, absolute and continued, or, as it is commonly called, *solitary confinement*, has proved to be deleterious to the criminal, and practically certain to produce insanity

after a limited period of time. As a modification of this, *separate confinement*, so called, was introduced, in which the prisoners are confined separately day and night, but are allowed to receive as visitors certain officials or other persons specially designated, as the chaplain, and the governors and the representatives of vigilance and prisoners' aid societies.

The science of criminology, strictly speaking, began with the observations of English jail surgeons and other learned men, such as Forbes Winslow (1854), Mayhew (1860), Thomason (1870), Wilson (1870), Nicholson (1872), Maudsley (1873), etc. Yet criminal anthropology as an independent science may be said to have first asserted itself with the first edition of *The Criminal*, published in 1876 by Lombroso, and with this work, and the many other works published by the same author and by other Italian students and writers, may be said to have begun the modern school of criminology. Since that time there has been a flood of literature on the subject, but the science is still in its infancy so far as producing well-defined and well-recognized principles for the regulation and prevention of crime and the treatment of criminals is concerned. The question of the efficacy of various reform methods is unsettled; the proportionate number of relapses of reformed criminals has not been satisfactorily shown; the moral responsibility of criminals is still as much in dispute as before; and the same is true of most of the numerous other vitally important subjects investigated; but it would seem that with the accumulation of statistics of greater reliability and the continued research and increased understanding devoted to the subject, the day can not be far distant when great results shall be accomplished toward achieving the ends and purposes for which the science exists.

A few only of the more important criminological works that have been published are *L'homme criminel, étude anthropologique et medico légale*, by Lombroso (1887); *La criminologie, étude sur la nature de crime et la théorie de la pénalité*, by Garofalo (1888); *The Criminal*, by Ellis (1890); *Sociologia criminale*, by Ferri (1892); *Le crime*, by Joly (1888). In *Abnormal Man*, by Arthur MacDonald (1893), will be found a very full bibliography of works on the science of criminology. F. Sturges Allen.

Croes, John James Robertson: civil engineer; b. in Richmond, Va., Nov. 25, 1834. He was graduated at the College of St. James, near Hagerstown, Md., in 1853; and in 1856 he began the practice of civil engineering in the service of the N. J. R. R. Co. In 1857–1860 he was employed on the construction of the Ridgewood reservoir of the Brooklyn water-works, and 1860–1863 on the Croton reservoirs and the enlargement of High Bridge in New York city. In 1863–1865 he was principal assistant engineer of the Washington, D. C., water-works, and after a short time spent in examination of the Cincinnati, O., water-works, and the St. Louis, Mo., harbor improvements, took charge of the construction of the first storage reservoir dam in the Croton Valley, at Boyd's Corners, N. Y. Among other works, the water-works of Newark, N. J., Princeton, N. J., Lancaster, Pa., New Rochelle, N. Y., Syracuse, N. Y., and the sewers of Geneva and New Rochelle were built after his plans. He was one of the commissioners to report on the plans for the great Croton dam, and examined the rivers at Johnstown, Pa., with a view to the prevention of floods. He has furnished numerous contributions to engineering literature in journals and encyclopædias. Mr. Croes has been a member of the American Society of Civil Engineers since 1867; was treasurer of the society for ten years, its vice-president in 1888, and its president in 1901. He is a member of the Institution of Civil Engineers of Great Britain.

Cronje, Piet: Boer general; b. in Orange Free State (now Orange river colony) about 1850. At the beginning of the Transvaal war of 1899–1900 he was put in command of the Free State forces; he effected the sieges of Mafeking and Kimberley, and conducted the campaign on the Modder river. While retreating before the vastly superior force of Lord Roberts, he was surrounded with about 3,000 of his men at Paardeberg, and surrendered Feb. 27, 1900. He was deported to St. Helena.

Crowninshield, Caspar: soldier; b. in Boston, Mass., in 1837; graduated at Harvard in 1860; entered the army as a captain of volunteers in 1861, became a major in 1863, lieutenant-colonel March 1, 1864, and colonel Oct. 21, 1864; commanded a brigade of cavalry under Sheridan, serving through the Shenandoah and Appomattox campaigns, and was present at the surrender of Gen. Lee; was breveted brigadier-general May 20, 1865, and retired a month later. D. in Boston, Jan. 10, 1897.

Cuba: On Feb. 24, 1895, after several years of secret preparation, the latest of the rebellions against Spanish sovereignty in Cuba began. The causes that produced it were the same that had kept the island in insurrection or discontent for a half-century. The insurgents soon formed the Republic of Cuba, but their government sought in vain to secure recognition from the U. S.

At the close of 1897 the greater part of the interior of the island was in the hands of the insurgents, but all the large towns and the coasts were held by Spain, which, from first to last, had sent 200,000 soldiers to Cuba. General Martinez Campos, who had been appointed captain-general and instructed to put down the insurrection, having resigned, was succeeded by Gen. Weyler. Weyler, as a war measure, ordered all the dwellers in the rural districts, under pain of death if they disobeyed, to concentrate in the large towns. There they were known as *reconcentrados*. Hemmed in by the garrisons, large numbers of them perished of hunger, though relief was sent from the U. S.; and it is said the rural populace of the western provinces of Pinar del Rio, Havana, Matanzas, and Santa Clara was practically exterminated. Weyler was the object of so much indignation on account of his alleged inhuman methods that he was forced to retire, and was succeeded by Capt.-Gen. Blanco.

In earlier years the Spanish crown had repeatedly promised reforms, and, in particular, greater political privileges. No promise had been fulfilled, and the Cubans regarded the pledge of an autonomist government, granted late in 1897, as the merest subterfuge. The grievances of the Cubans, the alleged inhumanity of the Spanish conduct of the war, and the immense loss to the commerce of the U. S., which had declined $69,000,000 a year for three years, or over two-thirds of the normal trade with the island, had produced a profound impression in the U. S., which was greatly intensified by the blowing up of the U. S. battleship Maine in the harbor of Havana, on the night of Feb. 15, 1898, with the loss of more than 260 of her crew; and on Apr. 11 President McKinley sent a message to Congress recommending armed intervention in Cuba. On the 19th Congress demanded the withdrawal of Spain from the island; on the 21st the President sent an ultimatum to Spain, and on the same day the U. S. minister to Spain and the Spanish minister at Washington received their passports. On the following day a U. S. squadron set out to blockade the ports of Cuba from Cardenas, on the north coast, around the west end of the island to Cienfuegos, on the south coast.

The leading events of the war were the destruction on May 1 of the Spanish fleet in the Bay of Manila, in the Philippines, by Commodore Dewey's squadron; the hunt for the Spanish squadron under Admiral Cervera by the squadron of Rear-Admiral Sampson, ending in the bombardment of the forts at San Juan, the capital of Puerto Rico, on May 12; the blockade of the port of Santiago de Cuba, in which Cervera's squadron had taken refuge, beginning on May 24; the landing of the first U. S. force in Cuba, 600 marines, at Guantanamo Bay, on June 10; the vain attempts of the Spaniards to dislodge them on June 11–14; the landing of about 18,000 troops near Santiago, under command of Major-Gen. Shafter, on June 22, 23; the first land fight near Santiago, in which 16 of the attacking force were killed and 40 wounded; the assault on the outworks of Santiago on July 1, 2, the total loss in the fighting before Santiago being 236 killed, 1,274 wounded, and 84 missing; the destruction of Admiral Cervera's squadron, while attempting to escape, on July 3, by the North Atlantic fleet, under Rear-Admiral Sampson, the Spaniards losing 6 war-ships, about 600 killed, and over 1,300 prisoners; the surrender of Santiago and the eastern end of Cuba to Gen. Shafter, with about 22,000 Spanish troops, on July 14; the landing of Gen. Miles and about 20,000 troops in Puerto Rico, July 25 *et seq.*; and the capture of Manila by troops from the U. S. under Gen. Merritt, aided by Dewey's ships, Aug. 13.

On Aug. 12 a protocol was signed, providing for the cessation of hostilities, the surrender of Spain's title to Cuba, the cession of Puerto Rico and one of the Ladrones to the U. S., and the occupation of Manila by the U. S. until the conclusion of a formal treaty of peace.

By the treaty of peace, which was signed in Paris, Dec. 10, 1898, Cuba became practically a dependency of the U. S., and was at once put under a provisional military government. The U. S. assumed the responsibility of preserving order and protecting life and property until such time as

the Cuban people should organize a stable government capable of maintaining internal order, and fulfilling international obligations. Gen. John R. Brooke was the first military governor-general, and had control of the civil administration as well as military affairs; he was succeeded Dec. 13, 1899, by Gen. Leonard A. Wood. Cuban mayors and aldermen were appointed in every municipality, and a supreme court was established. The post-office was reorganized on the model of that of the U. S.; a new and more general system of public education was introduced: many burdensome taxes were abolished; and a customs tariff established. Strict sanitary measures were imposed in all parts of the island, and improvements begun on roads, railways, docks, and harbors. In 1900, by the gift of Harvard University, more than 2,000 Cuban school-teachers were enabled to attend the summer school of that institution. On Sept. 15, 1900, an election of delegates was held, for a constitutional convention, which met on Nov. 5 of the same year, looking toward the framing of a constitution for the government of the island. On June 12, 1901, the constitution was adopted, and afterward approved by the Government in Washington.

For Spanish views, see Cuyas, *The New Constitutional Laws for Cuba* (New York, 1897); for Cuban views, *Free Cuba*, edited by John Guitéras (Philadelphia, 1896). See also J. H. Clark, *Cuba and the Fight for Freedom* (Philadelphia, 1896); Richard Harding Davis, *Cuba in War Time* (New York, 1897); A. S. Rowan and M. M. Ramsey, *The Island of Cuba* (New York, 1896); C. Benoist, *L'Espagne, Cuba, et les États-Unis* (Paris, 1898). C. C. Adams.

Cui, Cesar Antonovitch: composer; b. in Wilna, Russia, Jan. 6, 1835, and educated in St. Petersburg as an engineer; studied music under Moniuszko and Balakireff, and wrote favorably in St. Petersburg papers of Schumann, Berlioz, and Liszt; wrote also for musical papers in Russia and France; composed four operas and much other music for orchestra, piano, violin, and voice. He has also written several books on the art of war, and was Professor of Fortification in the School of Engineering in St. Petersburg.
D. E. Hervey.

Cummings, Thomas Seir: painter; b. in England in 1804. He was taken to New York in childhood, and early in life studied under Henry Inman; became celebrated for his miniatures, which he produced rapidly until the introduction of photography, numbering among his sitters many persons of distinction; was one of the founders of the National Academy in 1826; commanded a militia regiment for several years, and was commissioned brigadier-general by Governor Seward in 1838. He retired to a farm in Connecticut about 1866, having published *Historic Annals of the National Academy from its Foundation to 1865*. D. in Hackensack, N. J., Sept. 24, 1894.

Curzon, George Nathaniel: statesman; b. in 1859, being the eldest son of the Rev. A. N. H. Curzon, Baron Scarsdale, rector of Kedelston, Derbyshire, England; he was educated at Balliol College, Oxford, and at Eton, where he took high rank in classics, winning prizes for essays and a fellowship at All Souls'; was prominent in the Oxford Union Debating Society, holding its chair for a term; became assistant private secretary to the Marquis of Salisbury 1885; entered Parliament 1886, winning the Southport division of Lancashire from the Liberals, and retained his seat by increasing majorities. His extensive travels in the East, several times as correspondent of the London *Times*, resulted in the publication of *Russia in Central Asia* (1889), *Persia and the Persian Question* (1892), and *Problems of the Far East* (1894). In 1895 the Royal Geographical Society awarded to him its gold medal, in recognition of his contributions to geographical knowledge. He became Under-Secretary for India 1891, holding that position until the fall of the Salisbury administration; in 1895 became Under-Secretary of State for Foreign Affairs, and was made a privy councilor; in the same year was married to Mary Victoria Leiter, of Chicago, Ill. On Aug. 30, 1898, he was appointed Viceroy and Governor-General of India, succeeding the Earl of Elgin at that post, having first been elevated to the peerage as Baron Curzon of Kedelston.

Cusack, Mary Frances (the *Nun of Kenmare*): b. near Dublin, Ireland, May 6, 1830; lived in England during most of her early life, and began writing for publication while very young. She became a member of a religious sisterhood of the English Church, but was soon converted to Roman Catholicism and returned to Ireland, where in 1859, at Newry, she joined the Irish Poor Clares, a community of Franciscan nuns, devoted to the education of poor girls. In 1861 she established a convent of Poor Clares at Kenmare, where she remained until 1884, in which year Pope Leo XIII. personally authorized her to found a new order called Sisters of Peace, with the purpose of establishing homes for friendless girls, teaching domestic service, and inculcating moral habits. The first house of the order was opened in 1884 in Nottingham, England. In 1885 a house of Sisters of the Peace was established in Jersey City, N. J., the first in the U. S. Efforts for the relief of the peasants of Kenmare led to controversies with many of the great landlords, and with some English Catholics; but most of the leading Irish Catholics, including the clergy, have been in sympathy with the movement. She visited the U. S. in 1886. She published many works, chief among them being a *Student's History of Ireland*, *Woman's Work in Modern Society*, *The Pilgrim's Way to Heaven*, *Jesus and Jerusalem*, *The Book of the Blessed Ones*, and lives of Daniel O'Connell, St. Patrick, St. Columba, and St. Bridget. D. June 7, 1899.

Cusack-Smith, Sir Berry, K. C. M. G.: b. in Dublin, Ireland, in 1859. He took his degree at Eton College, was called to the bar in 1884 at the Middle Temple, and received a law scholarship in 1885; spent some time in the volunteer army; chancellor of the Primrose League 1887-89; was appointed consul at Samoa and deputy commissioner for the Western Pacific 1890; consul-general at Valparaiso 1891; deputy commissioner for Tokelau islands and acting British resident 1892; special judicial commissioner in 1893, and jointly with the German and U. S. consuls acted as adviser to the King of Samoa, and as receiver and custodian of revenues of Samoa and president of the municipality of Apia, 1893–97. He was knighted in 1898. F. S. A.

Cust, Robert Needham, LL. D.: English lawyer and linguist; b. in Bedfordshire, England, Feb. 24, 1821; studied at Eton College 1834–40; East India College, Haileybury, 1840–42, and the College of Calcutta 1843–44, with high honors, going to India in 1843; held high civil positions in the East India Government, including membership of the Viceroy's legislative council, and the Home Secretaryship to the Government of India 1864–65. Among his published works are *Modern Languages of East India* (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); *Poems of Many Years*; and numerous other essays and works on linguistic and religious subjects. He was called to the bar at Lincoln's Inn in 1857, and made LL. D. by the University of Edinburgh in 1885. He is honorary secretary of the Royal Asiatic Society and vice-president of the British and Foreign Bible Society. F. S. A.

Cutler, John, M. A.: English jurist; b. in Dorchester, England, Jan. 9, 1839; received his early and college education at King's College School, London, Exeter College, Oxford University, and at Edinburgh University; was called to the bar in 1863, and made queen's counsel in 1897; was made Professor of English Law and Jurisprudence at King's College, London, in 1865, which position he still holds. Has edited *Reports of Patent Design and Trade Mark Cases*, published by the Patent Office, since 1884; *Powell on Evidence* (7th ed. 1892, and several of the previous editions); the second *English Translation of Ortolan's History of Roman Law* (1896); and has published a *Treatise on the Law of Naturalization*; *Treatise on the Law of Voluntary Settlements*; and other minor works.
F. Sturges Allen.

Cutter, George Washington: poet; b. in Massachusetts, in 1801. Having studied law, he practiced in Kentucky until about 1845; was captain of a company of infantry in the Mexican war; became an active politician, and was noted for his oratory; held a clerkship in the Treasury Department at Washington through several administrations, during which time he wrote poems that attracted much attention, among them being *The Song of Steam*, *The Song of the Lightning*, and *E Pluribus Unum*. His published works are *Buena Vista and other Poems* (1848); *Song of Steam and other Poems* (1857); and *Poems, National and Patriotic* (1857). D. in Washington, D. C., Dec. 24, 1865.

Cutting, Hiram Adolphus: geologist; b. in Concord, Vt., Dec. 23, 1832. Having been a teacher of the natural sciences in the seminary of Montpelier and in Norwich University, he became curator of the State cabinet of natural history in

1871, and was made State geologist in 1872, afterward becoming fish commissioner. His experiments in fertilizing soil and on the growth of plants, and his observations on insects, attracted attention to his scientific knowledge. He delivered lectures on *The Bible: its History and Scientific Relations*, *God in Creation*, etc. Among his many published works are *Microscopic Revelations* (1878); *Farm-pests, including Insects, Fungi, and Animalcules* (1879); *Notes on Building-stones, also on Plant-growth* (1880); *Scientific Lectures* (1884); and *Farm-lectures* (1884). D. in Lunenburg, Vt., Apr. 18, 1892.

Cutting, James Ambrose: inventor; b. in Massachusetts, in 1814. While living in Haverhill he invented a beehive, the success of which induced him to move to Boston and experiment on a larger scale. After examining the art of daguerreotypy, he invented a process of making similar pictures on glass, which he called ambrotypes. An aquarium and the aquarial gardens were established by him in Boston. D. in Worcester, Mass., July 31, 1867.

Dahlgren, Madeline Vinton: author; b. in Gallipolis, Ohio, about 1835. She was married to Admiral Dahlgren in 1865, before which time she had become somewhat noted as the author of poems and sketches, under the pseudonym of *Corinne*. The woman-suffrage movement was strenuously opposed by her in 1870–73, when, with a large list of signers in sympathy with her views, she petitioned Congress against the extension of the franchise to women. The Literary Society of Washington, of which she was one of the founders, first met at her house, and continued to meet there for many years, her influence serving to make that organization judiciously exclusive and refined. At South Mountain, Md., she built, out of her own means, the chapel of St. Joseph's of the Sacred Heart of Jesus, and was for several years president of the Ladies' Catholic Missionary Society of Washington. For translating from the Spanish the *Catholicism, Liberalism, and Socialism* of Donoso Cortes she received the thanks of Pius IX. From the French she translated Montalembert's *Pius IX.*, also De Chambrun's *Executive Power*. Her original publications include *Idealities* (1859); *Thoughts on Female Suffrage* (1871); *South Sea Sketches* (1881); *Etiquette of Social Life in Washington* (1881); *South Mountain Magic* (1882); *A Washington Winter* (1882); *Memoirs of John A. Dahlgren* (1882); *The Lost Name* (1886); and *Lights and Shadows of a Life* (1886). D. in Washington, D. C., May 28, 1898.

Dakar: the best harbor on the coast of Senegambia, sheltered throughout the year, and near Cape Verde, the most western point of Africa. In spite of its advantages, however, and the bar that obstructs the entrance to St. Louis, the latter port attracts most of the shipping trade with Senegal. France and her colonies in 1897 furnished more than half the imports and brought more than half the exports of Senegal. The foreign trade in 1897 was, exports, $4,227,330; imports, $5,835,987. C. C. Adams.

Dale, James Wilkinson: clergyman and author; b. at Cantwell's Bridge, Del., Oct. 16, 1812. Having graduated at the University of Pennsylvania in 1831, he began the study of law, which he soon abandoned for theology, taking courses at Andover and Princeton. He was agent for the American Bible Society 1838–45, and, after holding various pastorates, retired in 1876, devoting himself to literature. His exhaustive *Inquiry into the Meaning of βαπτίζω as Determined by Usage* includes *Classic Baptism* (1867), *Judaic Baptism* (1869), *Johannic Baptism* (1871), and *Christic and Patristic Baptism* (1874). D. in Media, Pa., Apr. 19, 1881.

Dall, Caroline Healey, LL. D.: author; b. in Boston, Mass., June 22, 1822. She was privately educated, after which she became a teacher. In 1877 she received the degree of LL. D. from Alfred University. Early in life she devoted her pen to topics of reform, chiefly exploring new fields of labor for women; later she essayed various branches of literature. Among her numerous publications are *Essays and Sketches* (1849); *Historical Pictures Retouched* (1859); *Woman's Right to Labor* (1860); *Life of Dr. Marie Zabrewska, being a Practical Illustration of Woman's Right to Labor* (1860); *Woman's Rights under the Law* (1861); *The College, the Market, and the Court, or Woman's Relation to Education, Employment, and Citizenship* (1867); *Egypt's Place in History* (1868); *Patty Gray's Journey to the Cotton Islands* (1869–70); *Romance of the Association, or One Last Glimpse of Charlotte Temple and Eliza Wharton* (1875); and *What we Really Know about Shakespeare* (1885).

Daly, Joseph Francis, LL. D.: b. in Plymouth, N. C., Dec. 3, 1840; removed to New York with his parents in 1849, where he received his early education: studied law and was admitted to the bar in May, 1862; practiced his profession of law until 1870, when he was elected to the Court of Common Pleas of the State of New York; served continuously as judge of that court from 1870 until Jan. 1, 1896, when he was transferred to the Supreme Court under the amended Constitution of the State, where he served until the expiration of his term of office, Dec. 31, 1898. His judicial opinions are among the most highly respected of any in the State. Judge Daly has been active politically and socially, and was one of the founders of the Players' Club, and is (1899) the president of the Catholic Club of New York city. Besides his opinions as judge, he has written a large number of editorial articles and miscellaneous writings for various magazines. His reports appear in Daly's, Abbott's, and Howard's *Reports*, the *Miscellaneous Reports*, the *New York State Reporter*, and the *New York Supplement*. He is an active Democrat, but was nominated by the Republicans in 1898 for re-election to the Supreme Court and defeated.

F. Sturges Allen.

Daly, Thomas Mayne, Q. C.: lawyer; b. in Stratford, Ontario, Aug. 16, 1852; educated at Upper Canada College; admitted to the bar in 1876; settled in Brandon, Manitoba, 1881, and became its mayor in 1882. He was a member of the House of Commons 1887–96; became Minister of the Interior under Sir John Thompson Dec. 5, 1892, and held that portfolio until the retirement of the Bowell administration in Apr., 1896. In 1896 he went to England in the interest of Canadian immigration, and served as a delegate to the Third Commercial Congress in London.

Damages: in modern law, the equivalent in money, or estimated equivalent in money, of detriment or injury sustained; specifically, such equivalent as decided by a court or jury in a legal proceeding. The right to damages is peculiar to the common law, as distinguished from equity, equity aiming to give specific relief by enforcing the performance of the thing agreed to be done, executing trusts, compelling the giving of testimony, etc., but generally refraining from awarding pecuniary damages. The general aim of the common law, or the end accomplished by an action at common law, is a judgment awarding money damages to the party injured, as by breach of contract or tort. Among the systems of the more primitive races, where the reference of values to a money standard has not become thoroughly established, both now and anciently, damages are given more or less in kind or in some chattel representing a rough standard of value. Numerous instances of this occur in the laws of the Pentateuch; as in the case of the goring of an ox, cited below, where we see an equitable combination of assessment of damages in kind, in the dividing of the dead ox; and in money, in the dividing of the purchase price of the live ox.

Damages under Various Systems of Law.—In the Jewish law specific damages were assessed in almost all classes of cases without exact reference to the actual injury sustained in the particular case. Thus, in Exodus, chap. xxi., v. 32, it is provided that "if a man's ox push a manservant or maidservant, he shall give unto their master thirty shekels of silver, and the ox shall be stoned." And again, later, in chap. xxii., v. 9, "for all manner of trespass, whether it be for ox, for ass, for sheep, for raiment, or for any manner of loss in which another challengeth to be his, the cause of both parties shall come before the judges, and whom the judges shall condemn he shall pay double unto his neighbor."

Chapter xxxi., v. 35, provides, "if one man's ox hurt another's that he die, then they shall sell the live ox and divide the money of it, and the dead ox also shall they divide." In the Hindu law this same principle is found, and the same principle is applied to torts, it being provided that "where a claim is proved, the person who gains the suit is put in possession, and the judge exacts a fine of equal value from the defendant. And if the defendant loses his cause, he in like manner pays double the sum sued for." In the Roman law the subject was elaborately but not very definitely nor consistently treated. With the Roman jurists, until the despotic days of the empire, the same line was drawn between questions of law and questions of fact as in the Anglo-Saxon law. The magistrate who heard the cause did not decide it, but turned over the matter to a *judex*, or single juror or referee, charging him much as a jury is charged by the judge for his guidance in the decision; but

particularly with respect to the defendant's liability in damages the judex or referee seems to have had a large discretion, restrained, however, to a certain extent, by special statutes. In the Roman law the general definition of damages was the actual loss sustained and the profit which might have been made. Inquiry was made in each case as to whether the defendant was to be held guilty of fraud or evil intent (*dolus*), or of fault or negligence (*culpa*) only; and if of *culpa*, whether of *culpa lata* (gross negligence) or *culpa levis* (slight negligence), and in the determination of these questions the judex seems to have had a wide discretion. The awarding of damages (*compensatio*) seems to have been under no well-settled rules by which the judex was governed; but in cases of fraud or gross negligence the plaintiff (*actor*) was permitted to swear to the amount of the injury sustained, with little, if any, check, except the power of assessment by the judex. Later, various statutory provisions were made in the attempt to do away with this difficulty by fixing valuations. Thus, under the *Lex Aquilia* a trespasser who killed a slave or cattle except by mere chance was required to pay to the master as much as the property had been worth at any time within the year. In the civil law the early features of the Roman law seem to have been retained, the amount of the damages being left very much to the discretion of the tribunal. Under this system, as established in France, and previous to the adoption of the Napoleonic Code, damages were divided into interest and damages (*intérêts* and *dommages intérêts*).

Damages at the Common Law.—The common law differs materially from the preceding systems in the treatment of the question of damages. Its general rule may be stated to be, that for every invasion of a legal right the law grants a remedy by which compensation is made for the injury inflicted, or "wherever the common law gives a right or prohibits an injury it also gives a remedy by action"; and this remedy is co-extensive with the injury done, whether it be to property or the person or rights or reputation of the person. The remedy extends both to civil injury and breach of contract, the object of the remedy in either case being to give to the plaintiff the *actual loss* or damages suffered by him by reason of the action of the defendant. The question as to what constitutes *compensation*, however, under the common law is very technical, and the interpretation of the word compensation is very restricted; so that, unless the word be understood in its technical sense, it is inaccurate as an expression of the equivalent given as the measure of damages.

In general, the injuries which give rise to a right to damages may be classed as injuries to property, physical injuries, mental injuries, injuries to family relations, injuries to personal liberty, and injuries to reputation; and all of the facts or circumstances which constitute a right of action for damages may be brought under one or more of these heads. The measure of damages is governed by complex rules, difficult both of application and of concise treatment. See DAMAGES, MEASURE OF; TRESPASS, SLANDER, LIBEL, BREACH OF CONTRACT, etc. See also Sedgwick on *The Measure of Damages*; Guthrie Smith on *The Law of Damages*; Pollock on *The Law of Torts*; Mayne on *The Law of Damages*; Anson on *The Law of Contracts*. F. STURGES ALLEN.

Danes Island: a small island off the northwest coast of Spitzbergen, to which whalers occasionally resort. It was on the north side of this island that the aëronaut Andrée inflated his balloon and started northward on July 11, 1897. The mountains partly surrounding the air-ship protected it from the full force of the winds during the process of inflation. C. C. ADAMS.

Danforth, MOSELEY ISAAC: engraver; b. in Hartford, Conn., Dec. 7, 1800. Having studied bank-note engraving, in 1821 he settled in New Haven, where he executed a celebrated plate after Raphael Morghen's engraving of the *Parce Somnum Rumpere*, and subsequently moved to New York, where he became one of the founders of the New York Drawing Association in 1825, and of the National Academy of Design in 1826, during which period his full-length engraving of Lafayette was completed. In 1827 he went to England. He lived in London for ten years, studying in the Royal Academy, where his drawings from the Elgin marbles became celebrated. Although most of his work while in London seems to have been on plates for books, a number of his best-known engravings were done during that time, such as *The Sentry-box*, *Don Quixote*, and portraits of Washington Irving and Sir Walter Scott. Returning to New York, he worked chiefly on vignettes for bank-notes, became partner in a bank-note engraving firm which was merged in the American Bank-note Company in 1858, and was vice-president of that corporation when he died, in New York city, Jan. 19, 1862.

Daniel, JOHN MONCURE: editor; b. in Stafford co., Va., Oct. 24, 1825. He was educated privately, studied law in Fredericksburg, Va., and moved to Richmond in 1845, where, in 1847, he joined the staff of the *Richmond Examiner*, his biting invective leading to several duels. He was a pro-slavery advocate and unorthodox in religion. Under his management the *Examiner* became the leading Democratic newspaper of the South, and was noted for its high literary character. He was one of Virginia's first and most ardent secessionists. While filling the post of minister to the court of Victor Emanuel, to which he was appointed by President Buchanan, he demanded for Italians naturalized in the U. S. and visiting Sardinia the same immunities extended to any other American, and threatened a rupture of diplomatic relations, in which he was not supported by his Government. He caused several social scandals in Turin, first by escorting to a royal ball an uninvited lady (the Countess Marie de Solms, afterward Madame Ratazzi), and next by a letter (inadvertently made public by its recipient) ridiculing the habitués of the court. At the outbreak of the civil war he returned home, and served on the staff of Gen. A. P. Hill, when, his arm being shattered, he resumed editorship of the *Examiner*, through the columns of which he bitterly attacked Jefferson Davis and Elmore, the Confederate treasurer. Challenged by the latter to a duel, he accepted, though unable to point his pistol, on account of his wounded arm, and was shot in the leg. He died in Richmond, Va., Mar. 30, 1865, three days before the downfall of the Confederacy, which event he had confidently predicted.

Daniels, WILLIAM HAVEN: author; b. in Franklin, Mass., May 18, 1836. He received education at Wesleyan University; after traveling in Europe, became librarian of the Northwestern University in 1866, and Professor of Rhetoric in the Illinois Wesleyan University in 1868; after several years' service as a minister in the Methodist Episcopal Church, accompanied the evangelist Moody to Europe in 1875, and after 1881 devoted himself to evangelism and to literature, resigning connection with the New England Conference in 1885. He has published *D. L. Moody and his Work* (1875); *That Boy: Who Shall Have Him?* (1878); *The Temperance Reform and its Great Reformers* (1878); *Moody, his Words, Works, and Workers* (1879); *The Illustrated History of Methodism in the United States* (1880); *A Short History of the People Called Methodist* (1882).

Danks, HART PEASE: musical composer; b. in New Haven, Conn., 1834. *Lake Street*, his first composition, appeared in Bradbury's *Jubilee*; his first song, *The Old Lane*, came out in 1856, and was followed by several hundred others, two of which, *Silver Threads among the Gold*, and *Don't be Angry with me, Darling*, became widely popular.

D'Annunzio, GABRIELE: novelist and poet; b. in Italy, in 1864; was educated at the College of Prato, Tuscany, and at the University of Rome; has been a member of the Chamber of Deputies. His first book of verse, the *Intermezzo di Rime*, was published when he was barely twenty years of age; this was immediately followed by a collection of short stories, *Il Libro delle Vergini*, and by more poems; then came the novels *Il Piacere* (1889), *L'Innocente* (1892), *Giovanni Episcopo* (1892), *Trionfo della Morte* (1894), and *Vergini delle Rocce* (1896), the last named being the first part of a romantic trilogy: the three volumes *Il Piacere*, *L'Innocente*, and *Trionfo della Morte* comprise a series classified as *I Romanzi delle Rose*. He is a subtile interpreter of sex-emotions, the love motive predominating in all his work. His *Triumph of Death* has probably been more widely read in England and America than any other modern translation from the Italian. A capable critic has thus spoken of his work: "Of the female sex D'Annunzio accepts the conventional view that is still prevalent among the Latin nations. Woman exists for man, for his pleasures, his domestic comfort, often for his ruin, but she has no independent life, no separate entity, no ideals apart from those of sexual love. No higher possibility for the sex has dawned upon the novelist; even religion, save as a conventional accessory, is denied to her."

Darnell, Rev. HENRY FAULKNER, D. D.: b. in London, 1831; educated at Trinity College, Dublin, and at Cambridge;

taught mathematics and classics in Raphoe, Ireland, for a time, and was ordained a priest of the Church of England in 1859; served in various Canadian churches 1860–74; afterward principal of Hellmuth Ladies' College, London, Ontario, and of Dufferin College, in the same city; since 1883 rector of the Episcopal church in Avon, N. Y. He has written for American and English magazines, and published *The Cross Roads* (1856); *Songs by the Way* (1860); *Verses in Memory of Bishop Mountain* (1863); *Songs of the Seasons* (1885); *A Nation's Thanksgiving* (1886); *Philip Hazlebrook* (1887); *Flossy* (1889); *The Craze of Christian Englehart* (1890); *Kindesliebe* (1891); *Memorabilia of the Presidents of the United States* (1893); *A Four-leaved Clover* (1894); *Songs of the Season* (1895).

Daughters of the King: an order composed exclusively of women in the Protestant Episcopal Church. The object of the order is "the spread of Christ's kingdom among women and the strengthening of parish life." Members are admitted with a solemn service before the altar, invested with a cross, and pledged by a vow to prayer and service. The two principal rules are, first, to pray daily for the spread of Christ's kingdom, for God's blessing upon the order, and for the prosperity of the parish; second, to make an earnest effort, each week, to bring at least one woman within the hearing of the Gospel, and to aid the rector as he may deem necessary for the furtherance of the work of Christ. Any association of women communicants in any parish or mission of the Protestant Episcopal Church, under the name of Daughters of the King, with the approval of the rector or minister in charge of such parish or mission, the members of which ratify the constitution of the order, pledge themselves to obey the rules, and agree to wear the badge of the order habitually, is entitled to become a chapter. The badge is a Greek cross fleury of silver, charged on the horizontal with the words "Magnanimiter Crucem Sustine," and at the base of the perpendicular with the initials of the motto of the order, F. H. S.—"For His Sake." The order was first organized on Easter evening, 1885, in the Church of the Holy Sepulchre, New York city, and now exists in Canada and Australia. There are 640 chapters in America, with more than 15,000 members.

David, Laurent Olivier: journalist; b. in Sault au Recollet, province of Quebec, Mar. 24, 1840; educated at the College of Ste. Thérèse, and admitted to the bar in 1864. He assisted in founding the newspaper *Le Colonisateur* while he was a student, and has since been editor of *L'Opinion Publique*, *Le Bien Public*, and *La Tribune*. He was a member of the House of Commons 1886–90. He was president of the St. Jean Baptiste Society, Montreal, 1887–88. He has published *Biographies et Portraits* (1876); *Les Héros de Chateaugay* (1883); *Les Patriotes de 1837–38* (1884); *Mes Contemporains* (1894); *Les deux Papineau* (1896); *Le Clergé Canadien: sa mission et son œuvre* (1896), which was condemned by the Congregation of the Index in Rome.

Davidson, James Wood: author; b. in Newberry District, S. C., Mar. 9, 1829. After graduation at the South Carolina College, in 1852, he studied languages under private tutors; was Professor of Greek in Mt. Zion College, South Carolina, and became principal of the Carolina High School at Columbia; was adjutant of infantry in Jackson's corps of Lee's army; was literary editor of the New York *Evening Post* in 1873, and American correspondent of the London *Standard* 1873–78. He has done much critical writing for various periodicals. Among his published works are *Living Writers of the South* (1869); *The Correspondent* (1886); *Dictionary of Southern Authors*; and *Helen of Troy*.

Davidson, Leonidas Heber, M. A., D. C. L., Q. C.: lawyer; b. in Toronto, July 3, 1842; educated at Lennoxville and at McGill University, and admitted to the bar in 1864. He is especially esteemed as an authority on canon law, and has lectured thereon in Montreal Theological College. He was appointed Professor of Commercial Law in McGill University in 1881, and became dean of the law faculty in 1896, resigning in 1897. He was chairman of the Montreal citizens' committee formed to oppose the passage of the Jesuits' Estates Bill in 1889, and one of the originators of the Citizens' League and of the Good Government Association of Montreal.

Davidson, Lucretia Maria: poet; b. in Plattsburg, N. Y., Sept. 27, 1808. She received education at schools in Troy and Albany, but was prevented by ill health from following a course of study. She began writing verse at the early age of nine years, her first production being an *Epitaph on a Robin*. Under the title of *Amir Khan, and other Poems*, her writings were collected and published in 1829, with a sketch of her life by S. F. B. Morse, and a second edition, edited by her brother, M. O. Davidson, with illustrations by Darley, appeared in 1871. Southey said of her: "In our own language, except in the cases of Chatterton and Kirke White, we can call to mind no instance of so early, so ardent, and so fatal a pursuit of intellectual advancement." D. in Plattsburg, N. Y., Aug. 27, 1825.

Davidson, Margaret Miller: poet; sister of Lucretia Maria Davidson; b. in Plattsburg, N. Y., Mar. 26, 1823. She was noted for precocity and delicate sensibility, producing verses at the age of six years, and constructing a drama, called *Tragedy of Alethia*, at ten. Washington Irving introduced her verse to the public, and the poems of the two sisters were published together in 1850. D. in Saratoga, N. Y., Nov. 25, 1838.

Davis, Andrew Jackson: spiritualist; b. in Orange co., N. Y., Aug. 11, 1826. Owing to the poverty of his parents, his youth was passed at hard labor and with little education. Extraordinary clairvoyant powers are reputed to have been developed in him in 1843, and on Mar. 7, 1844, he is said to have fallen into a trance which lasted sixteen hours, during which time, according to his own assertion, he conversed with spirits and received instruction as to his future teachings. In Nov., 1845, while claiming to be clairvoyant, he dictated *The Principles of Nature, her Divine Revelations, and a Voice to Mankind*, his first work. Among his other many publications are *The Great Harmonia* (6 vols., 1850–61); *Philosophy of Spiritual Intercourse* (1851); *The Present Age and Inner Life* (1854–70); *The Approaching Crisis* (1852); *The Penetralia* (1856); *The World's True Redeemer* (1863); *Stellar Key to the Summer Land* (1867); *Arabula, or the Divine Guest* (1867); *Mental Diseases and Disorders of the Brain* (1871).

Dawson [named for Dr. George M. Dawson, director of the Geological Survey of Canada]: a steamboat landing, on the Upper Yukon river, of the Klondike mining district, Canada; situated in lat. 64° 5′ N., lon. 138° W. (see map of Canada, ref. 4–E). Gold was discovered on Bonanza creek on Aug. 16, 1896, from which event date the beginnings of Dawson. The town is 1,300 miles up the Yukon. The ascent of the river by steamers requires about forty days, and though the transportation companies send their goods by the river route, most miners prefer the shorter overland trails. The town is the distributing-point for all the gold-bearing creeks that compose the Klondike district. It has several hotels and restaurants, a theater, and a weekly newspaper (1898), sold at fifty cents a copy. Average pop. about 4,000. The mean temperature during the three coldest months is −24° F. C. C. Adams.

Dawson, Henry Barton: historian and editor; b. in Gosberton, England, June 8, 1821. Having settled in New York city in 1834, he edited the *Crystal Fount*, a temperance paper, 1845–46. His first attempt at historical writing, a *History of the Park*, was published in the *Corporation Manual*, 1855, and in 1858 he began the publication, serially, of his *Battles of the United States by Sea and Land*, which history brought about a spirited controversy concerning the merits of Gen. Israel Putnam. After serving in various editorial positions, in 1866 he became editor of the *Historical Magazine*, which he greatly enlarged. Other publications of his are *Current Fictions* (1864); *Recollections of the Jersey Prison-ship, by Capt. Thomas Dring, one of the Prisoners*, edited from the original manuscript (1865); and *Westchester County in the Revolution* (1886). D. in Morrisania, N. Y., May 23, 1889.

Day, James Roscoe, S. T. D., LL. D.: educator; b. in Whitneyville, Washington co., Me., Oct. 17, 1845. He studied at Bowdoin College with the class of 1874, but did not graduate. He entered the ministry of the Methodist Episcopal Church, and in 1893 became chancellor of Syracuse University, New York. S. M. J.

Day, William R.: statesman; b. in Ravenna, Ohio, Apr. 17, 1849; graduated from the University of Wisconsin in 1870, and returned to Ravenna to study law. While attending lectures in Ann Arbor he was made librarian of the university. In 1872 he was admitted to the Ohio bar, and two years later began to practice his profession in Canton, Ohio. In 1886 Mr. Day was elected Judge of the Common Pleas Court of the Ninth Judicial District. The next year

he resumed his practice, and later, on account of poor health, refused the position of U. S. District Judge for the Northern District of Ohio, to which he was nominated by President Harrison. Early in 1898 he was appointed Assistant Secretary of State, later became Secretary, and at the close of the war with Spain, having resigned the secretaryship, was one of the commissioners who arranged terms of peace in Paris.

De Bow, James Dunwoody Brownson: statistician; b. in Charleston, S. C., July 10, 1820. After seven years' service in a commercial house he was educated at Charleston College, where he graduated in 1843, and in the following year was admitted to the bar; edited the *Southern Quarterly Review* in 1844; in 1845 moved to New Orleans, where he established *De Bow's Commercial Review*, a periodical that soon became widely known and valued; became Professor of Political Economy and Commercial Statistics in the University of Louisiana in 1848, and was one of the founders of the Louisiana Historical Society; assumed charge of the census bureau of Louisiana in 1850; was appointed by President Pierce superintendent of the national census in 1853, during all which time he continued to edit the *Commercial Review*, which was suspended soon after the outbreak of the civil war. Having strenuously employed his pen and voice in advocacy of secession and in denunciation of the North, after the close of the conflict his views materially changed, and he admitted the superiority of the free-labor to the slave-labor system. His *Review* was resumed in New York city, and afterward moved to Nashville, Tenn. His principal works are *An Encyclopædia of the Trade and Commerce of the United States* (1853); *Industrial Resources and Statistics of the Southwest* (1853); *The Southern States. their Agriculture, Commerce, etc.* (1856). D. in Elizabeth, N. J., Feb. 27, 1867.

Decree: in law, the judicial decision of a court of equity or admiralty, answering to the *judgment* of a court of common law; the judgment of an equity or admiralty court. The decree of a court of equity, or a chancery court, differs from the judgment of a common-law court in that the judgment is simply for the plaintiff or for the defendant without qualifications or modifications; while the decree is the decision of the equity court pronounced after due hearing of all points in issue in the case, and deciding the relative rights and duties of the parties to the action or proceeding, according to equity and good conscience. The term judgment is now, however, used to include both the decree and the common-law judgment. (See Judgment.) Decrees are divided into interlocutory decrees, or those not deciding the cause itself, and final decrees, or those finally disposing of the cause so that there is nothing further for the court to adjudicate, the right of appeal in the U. S. being frequently restricted to final decrees.

In canon law, the term decree is applied to the first of the two main divisions of the *Corpus Juris Canonici*, or Gratian's decree. F. Sturges Allen.

De Garmo, Charles, Ph. D.: educator; graduated at Illinois State Normal University 1873; principal of public schools, Naples, Ill., 1873–76; teacher, Illinois State Normal University, 1876–83; student at Jena and Halle 1883–86; Professor of Modern Languages, Illinois State University, 1886-90; Professor of Psychology, University of Illinois, 1890–91; president of Swarthmore College 1891–98; became Professor of the Science and Art of Education, Cornell University, in 1898; president of National Council of Education 1898; president National Herbart Society 1892. He is the author of *Essentials of Method* (1889); *Herbart and the Herbartians* (1896); *Language Lessons* (1897); translator of Lindner's *Manual of Empirical Psychology as an Inductive Science* (1889); and editor of several works published under the auspices of the National Herbart Society. He is recognized as a leader of the Herbartian school in the U. S. C. H. Thurber.

De Lancey, Edward Floyd: b. in Mamaroneck, N. Y., Oct. 23, 1821; son of Bishop William Heathcote De Lancey; educated at the University of Pennsylvania and Hobart College, graduating at the latter in 1843; graduated at the Harvard Law School in 1845, and was admitted to the bar in New York in 1846, where he has since practiced his profession with intermissions. He traveled extensively in British America, Europe, Egypt, and Asia Minor, and made a special study of American history. He was president of the New York Genealogical and Biographical Society 1873–77, and of various other historical societies. He edited Jones's *History of New York during the Revolutionary War*, and *Secret Correspondence of Sir Henry Clinton* (the latter appearing in the *Magazine of American History*, 1883–84); is author of *Memoir of the Hon. Joseph De Lancey, Lieutenant-Governor of the Province of New York* (1851); *Capture of Fort Washington the Result of Treason* (1877); *Origin and History of Manors in the Province of New York* (1886); *History of Mamaroneck, New York* (1886); and various other memoirs and brochures. F. S. A.

Delcommune, Alexandre: African explorer; b. in Namur, Belgium, Oct. 5, 1855. Between 1886 and 1892 he traveled very extensively in the Congo basin, and after Stanley he is the most prominent figure in its exploration. He has added more detail to the map of the Congo system of waterways than any other man. Before engaging in exploration he had been in the African service since 1873, first as a trader on the lower Congo, and then as administrator and political agent for the Congo Free State. Leaving the state's service, he was engaged by the "Compagnie du Congo pour le commerce et l'industrie" of Belgium to conduct a commercial exploration of the upper Congo. In this service he explored throughout their navigable length the Kassai, Kwango, Lukenye, Sankuru, Chuapa, Lulonga, Lomami, Rubi, and other tributaries. Completing these investigations in 1889, he devoted the next three years to the exploration of the unknown upper waters of the Congo in the service of the commercial "Compagnie du Katanga" of Belgium. The geographical results were even more brilliant than his earlier achievements, particularly in the basin of the west or Lualaba headstream of the Congo, which he revealed, with its mysterious chaplet of lakes throughout its course. He also traced the Lukuga, which carries Tanganyika's waters to the Congo from the lake to the river, and proved that the mysterious Lake Landje of the Arabs, which was supposed to be the gathering-ground for the Congo's headstreams, and from which the true Congo issued, has no existence. He is still connected with the commercial development of the Free State in the interest of Belgian enterprises. C. C. Adams.

Dengler, Frank: sculptor; b. in Cincinnati, Ohio, 1853. He went abroad and studied in the Munich Academy of Fine Arts, where, in 1874, he was awarded a medal for his *Sleeping Beauty*; was for a time instructor in modeling in the Boston Museum Art School, resigning that position in 1877, when he moved to Covington, Ky., and afterward to Cincinnati. Among his more noted works are *Azzo and Melda*, and an ideal head of *America*.

Denio, Hiram: lawyer; b. in Rome, N. Y., May 21, 1799; studied law, was admitted to the bar, practiced in Rome and Utica, and in 1834 was appointed circuit court judge for the fifth circuit of the State of New York; in 1853 was appointed judge of the court of appeals, and subsequently twice elected to that office, retiring in 1866. He was one of the most eminent judges of the State of New York, and his opinions are frequently quoted. He edited, with William Tracy, an edition of the *Revised Statutes* of the State of New York (1852), and published five volumes of *Reports of Cases Argued and Determined in the Supreme Court and in the Court for the Correction of Errors* (1845–81). D. in Utica, N. Y., Nov. 5, 1871. F. Sturges Allen.

Denison, Charles Wheeler: author; b. in New London, Conn., Nov. 11, 1809. He edited the *Emancipator*, the first anti-slavery journal published in New York city; was U. S. consul to British Guiana 1853; during the civil war served as post chaplain in Winchester, Va., and as hospital chaplain in Washington city. He published *The American Village, and other Poems* (1845); *Paul St. Clair*, a temperance story (1867); *Out at Sea*, poems (1867); *Antonio, the Italian Boy* (1873); *The Child Hunters*, concerning the abuses of the padrone system (1877); and a number of short biographies, including *The Tanner Boy* (Grant), *The Bobbin Boy* (Banks), and *Winfield, the Lawyer's Son* (Hancock). D. in Washington, D. C., Nov. 14, 1881.

Denison, Mary Andrews: author; b. in Cambridge, Mass., May 26, 1826; wife of Charles Wheeler Denison. While with her husband in British Guiana, she wrote many sketches of tropical life for American periodicals. She wrote and published many books, but attracted little attention until the appearance of a farcical medley called *That Husband of Mine*, which was issued anonymously in 1874, and reached the phenomenal sale of more than 200,000 copies in a short time.

Denmark: For some years the winter climate has been abnormally mild, and in 1897–98 considerable quantities of ice were imported from Norway. In 1898 the Danish merchant steam fleet was increased by 49 steamships of 50,000 tons net, and nearly half of the increase was placed on the routes between Denmark and the U. S. This is due to the growth of trade between the two countries. The route from Copenhagen to Newport News and Norfolk was opened in Dec., 1897. The 6 steamers of this route also run to New Orleans, and carry freight from this country for all Baltic ports. Two large new steamers for the New York route were completed in 1898. Emigration from Denmark in recent years has amounted to about 4,000 a year, the larger part of which goes to Illinois. Agriculture, and particularly dairy farming, has had enormous development in the last few years. About 900 steam dairies, run on the share system, have greatly increased the butter product, and Denmark sells five times as much butter in England as France does. Butter-producers carefully consult the taste of purchasers, sending, for instance, light-colored and sparingly salted butter to England and yellow and heavily salted butter to South America. Refrigeration enables Denmark to share in the butter trade of the most distant countries. Denmark's sanitary control of cattle is unequaled in any other country. All cattle must be examined once a month by a veterinary surgeon. All the milk sold in Copenhagen must be from cows fed and treated in accordance with prescribed rules. Hog-raising is second in commercial importance, and bacon ranks next to butter in the exports. The trade in garden-truck with England is increasing. The growing interests of agriculture led in 1896 to the establishment of a Ministry of Agriculture as a branch of the Government. Manufacturing is less important. Only a few large manufactories are found outside of Copenhagen, whose machine-works, iron-foundries, and potteries are prominent. Cloth gloves, paper, tobacco, sugar, and tiles are also manufactured in various parts of the country, but Denmark requires large imports of textiles, iron and steel goods, and coal.

C. C. Adams.

Denver, University of: an institution of learning in Denver, Col., established as Colorado Seminary in 1864. It was reorganized in 1879 as the University of Denver. It has the following departments: A college of liberal arts, a school of medicine, Iliff School of Theology, a school of law, a school of dentistry, a graduate school, a school of music and fine arts, and a preparatory school. Its average enrollment at present is about 600 students. It has 500 graduates. It has nine buildings, costing $325,000. The Chamberlin Observatory, costing $50,000, was the gift of the late H. B. Chamberlin. The Iliff School of Theology was built and endowed by Mrs. Bishop Warren and Mr. William S. Iliff at a cost of $200,000. The total value of buildings, grounds, and endowment is not less than $1,000,000. Gov. John Evans, M. D., one of the founders of Northwestern University, was founder and first president of the board of trustees. The university is under the control of the Methodist Episcopal Church, but is non-sectarian in management. Since the reorganization there have been 3 chancellors, the Rev. David H. Moore, D. D., 1879–89, William Fraser McDowell, 1890–1900, and H. A. Buchtell, D. D.

De Reszké, de-res'kā, Édouard: bass singer; b. in Warsaw, Dec. 23, 1855, and studied first under his brother Jean, and later under celebrated teachers; made his first appearance as the King in Verdi's *Aïda* Apr. 22, 1876, at the Théâtre des Italiens, Paris. In 1880 he sang with success in Italy, and on Apr. 13, 1880, appeared in London as Indra in Massenet's *La Roi de Lahore*. Since then he has sung in England almost every season; he was engaged for the Metropolitan Opera-house, New York, in 1892, and has since been regular member of that company. D. E. Hervey.

De Reszké, Jean: tenor singer; b. in Warsaw, Jan. 14, 1852; received his first musical instruction from his mother; made his *début* under the name De Reschi in Venice, as Alfonso in *La Favorita*, in Jan., 1874, and for several seasons he sang baritone parts. On Apr. 11, 1874, he made his first appearance in London. Becoming convinced that his voice was a low tenor instead of a baritone, he began studying tenor parts, and made his *début* as a tenor at Madrid in 1879. Since then he has sung in all the principal opera-houses of the world. He came to New York with his brother Édouard as a member of the Metropolitan Opera-house company, and has since remained with that company. Within the last few years he has added the Wagner rôles to his repertory. D. E. Hervey.

Derwentwater, Floating Island of: Dr. H. R. Mill, who made a survey of Derwentwater in 1893, speaks of the floating island as a "small area of the weed-covered carpet of the lake which has risen to the surface like a huge blister." The surface was not solid enough to land on. A boat-hook was easily driven into the margin of the island to a depth of 5½ feet without meeting a solid foundation. On its withdrawal it was followed by a rush of gas smelling slightly of sulphuretted hydrogen. Dr. Mill inclines to the theory of Mr. Symons that the island was formed by the buoying effect of gas entangled in the vegetable felt. C. C. A.

Deshnef, Simeon: a Russian explorer of the seventeenth century, whose existence and work were almost wholly forgotten until his circumstantial report of his discoveries, preserved in the archives at Yakutsk, Siberia, was recently brought to light. In June, 1898, the Czar commanded that the name East Cape, by which the point of Asia nearest to North America has long been known, be renamed Cape Deshnef, in honor of the explorer who first sailed through Bering Strait and determined the eastern limit of Asia. It was not known in the middle of the seventeenth century that North America was not united by land with Asia, and Deshnef settled this weighty question. The political disorders that were greatly disturbing western Russia at that time diverted attention from Deshnef's discovery, and it was overlooked. Deshnef was prominent in the tide of exploration and adventure that set eastward through Siberia at that time. In 1648 he launched a small trading vessel on the Kolyma river, floated down to the Arctic Ocean, and turned east. Six other boats started with him, but in those stormy waters his craft was the only one to pass through Bering Strait and reach Kamtchatka. He did not see the North American mainland, but he proved that Asia was separated from it. About eighty years later, Captain Bering, ignorant of the work Deshnef had done, affirmed the separation of Asia from America, and the strait that divides them bears his name, while the pioneer explorer was not recognized in the geographic nomenclature of the region till 1898. Ninety-three years after Deshnef's journey, Bering found the neighboring American mainland and charted a long stretch of its coast. Thirty years earlier, in 1711, the Russian Popoff visited the Chukchi natives near the northeastern extremity of Asia, and the people told him of islands and a great land to the E. where the natives wore tails. Recent evidence has shown that the Chukchi narrative with regard to the tails was not so ridiculous as it was pronounced to be by those who heard Popoff's story. Dr. Dall and other explorers have shown that the Eskimos of the American side of Bering Strait, at their formal dances and festivals, fasten a wolf's or a dog's tail at the base of the spine. C. C. Adams.

Designs: In general, a design is any concrete realization of a conceived representation of form or shape. The word is specifically used, however, in the patent and copyright laws of the U. S. and Great Britain to designate certain realizations of form, color, or plan that may be protected by giving the inventor the monopoly of the use of the design for a limited period. Under the laws of the U. S., designs are protected by patent, and as such do not include engravings, cuts, prints, photographs or negatives thereof, paintings, drawings, chromos, statues, statuary, or models, or designs intended to be perfected as works of fine art. These latter are protected by copyright.

In Great Britain designs have always been protected by distinct statutes. These, however, were all repealed, and the regulation of the matter included in the Patents Act of 1883, by virtue of which designs may be patented or copyrighted for five years from the date of registration. The provisions of this act did not include engravings, photographs, paintings, drawings, sculptures, models, or copies of casts of human or brute figures, these being protected for longer periods under the copyright laws.

F. Sturges Allen.

Desire: the psychological state in which an end is held up for realization. Desire is distinguished from other active tendencies in the fact that the end desired is a consciously and clearly pictured one. In "impulse" we have an active state of a lower character, in which one is swayed largely by unconscious, deep-seated elements, and is often unaware of the real object on which the impulse goes out. In so-called "restlessness" this is still more the case. In

"appetite" the tendency is organic, and, while the end may be clearly pictured, it is not always so. But in desire consciousness sets up its own object, and the energies of action tend to go out for its attainment.

The psychological characteristics of desire are chiefly these:

(1) A sense of the so-called desirableness of the object held up before the mind. This is in most instances a matter of experience, and of pleasurable experience. We desire what we understand, and, further, what we think will bring on desirable consequences.

(2) The position that the quality which makes an end desirable is always pleasure of some sort is not now so commonly held as formerly. We often desire things which are immediately calculated to give us pain or discomfort. Yet in these instances the desire has its justification in some larger feature of the experience in question, which comes in as an additional circumstance to outweigh the immediate consequences. Furthermore—

(3) There is usually in desire a complex state of tension, of several active tendencies or appetencies aroused at once, all of which have more or less urgency of expression. We decide on the desirableness of the entire situation without weighing the single alternatives or elements separately, and certainly without adding up the contributions of each to our pleasure, or their tendency to produce pain. This position—that we always act for pleasure or to avoid pain—now very generally given up by psychologists, is the basis of so-called "hedonism" in ethics, and the balancing of pleasures and pains is called the "hedonic calculus."

(4) Desire is a matter of the attention. It always involves a relatively constant outgo and concentration of attention upon the object desired. So long as this lasts the thing desired grows more important for consciousness and more urgent in the life of action. Unless some break be made in the attention, action follows to attain the thing desired.

(5) This increased urgency is due probably to the stimulation in the brain of the equivalents of the actual movements necessary for the action. This brings into desire the sense of "means to ends." We always have a more or less clear sense of the actions necessary to the reinstatement of the desired experience, and the first act of will is in starting up this action. This is felt as urgency, restlessness, active strain, and it enters as an essential ingredient in the state of desire. It is often described as "incipient" action.

(6) The necessary inclusion of incipient action rules out of desire many things which would under other conditions be deemed desirable. For example: We do not desire things which are absolutely unattainable, or so remote that there are no means at our command to secure them. No American desires a seat in the House of Commons or a suit of uniform of the "Horse Guards." These things are not in the line of his "means"; he is not eligible; so the state of active desire is not aroused. Further, the desire becomes more vital, and its urgency more telling, in proportion as the means of attainment are more secure and within easy execution. It is this truth which makes so much of the more indifferent, and indeed the morally vital conduct of life, a matter of casual circumstance. The mere fact of availability, of easy means-to-ends or "open door," causes a temptation to get more ready entertainment. The incipient action which urges on the desire is aroused by the mere giving of attention to the channels of execution of the means: and so positive and strenuous effort becomes necessary to prevent calamity. We must then suppress the actions which have been more than commenced in their organic seats.

Finally, (7) desire is no longer desire when it has issued in action: desire then passes over into "volition." It is only while there is the state of relative tension, of more or less control and suppression, of waiting for opportunity, that desire is really present. The subsequent processes are summed up under the head of the "gratification of desire."

See the works of a general character given under PSYCHOLOGY. J. MARK BALDWIN.

Desty, ROBERT: jurist; b. in or near Montreal, Canada, Feb. 17, 1827; when fourteen or fifteen years of age went to New York city, where he entered upon the study of the law; abandoned this for a time to teach in Pennsylvania, and to serve in the Mexican war; then, after the declaration of peace, went to California with the "Argonauts"; was a member of the vigilance committee that rid California of lawlessness; continued his study of law, and was admitted to the bar in California, turning his attention first to legal editorial work; was elected a member of the California Senate by a large majority, but declared incompetent by reason of alleged non-naturalization; removed to St. Paul, Minn., in 1882, where for a time he was editor of the *Federal Reporter*, leaving which, he took up his work on *Taxation*; in 1885 removed to Rochester, N. Y., where he edited *Lawyers' Reports Annotated* until 1891, then taking up the final work on a treatise on contract law, which he had nearly finished at his death. Among his works, original or edited, are *Parker's California Digest* (1869); *Desty's California Citations* (1874); *Federal Citations* (1878); *Manual of Practice in the Courts of the United States* (8th ed. 1893); *Compendium of American Criminal Law* (1882); *Removal of Causes from State to Federal Courts* (3d ed. 1893). D. in Rochester, N. Y., Sept. 27, 1895. F. S. A.

Deutsch, SOLOMON: philologist; b. in Gleiwitz, Prussia, in 1816; cousin of Emanuel Oscar Menahem Deutsch; educated at the Universities of Breslau and Göttingen; accepted a call to a synagogue in Philadelphia in 1857, later was rabbi in Syracuse, Baltimore, and Hartford, and since 1885 devoted his entire time to literary and philological work. He published *Letters for Self-instruction in German*; *Medical German*; *Key to the Pentateuch*; and *Biblical History in Biblical Language*. D. in New York, Jan. 27, 1897, leaving unfinished two works on the study of languages.

De Vere, CLEMENTINE: soprano singer; b. in Paris, of a Belgian father and English mother, and went to New York in 1887, after having sung in various cities in France, Italy, and Spain, and made a concert tour with Campanini in 1888. She was engaged as the soloist of the choir of the West Presbyterian church. She joined the Metropolitan Opera Company as an extra soprano, but sang only a few times. Her American reputation has been made entirely in the concert-room. She is married to Romualdo Sapio, a teacher in the National Conservatory of Music.

D. E. HERVEY.

Devil's Island (*Ile du Diable*): a small island, 7 miles from the east coast of South America and 27 miles N. W. of Cayenne, the capital of French Guiana. It was the prison home of ex-Captain Dreyfus, formerly of the French army, who was degraded and sentenced to life imprisonment outside of France for the alleged crime of selling military secrets to a foreign power. Near the island are two others, St. Joseph and Ile Royal, and the group was first known as Iles du Diable. The unfortunate immigrants who had settled on the neighboring mainland fled to the islands from the pestilential coast in 1764 and renamed them Iles du Salut (Salvation islands), which name is still applied to the group. One of France's penal settlements has occupied St. Joseph and Ile Royal since 1854, but Dreyfus and his guards were the only tenants of Devil's Island. In the early days of French Guiana the islands were thonght to be of no value, and no use was made of them until the colonists took refuge on them. C. C. ADAMS.

De Vivo, DIEGO: manager; b. in Sarno, Italy, in 1822, and went to the U. S. in 1859, when he began his career as an operatic manager. He was associated with Strakosch, Maretzek, and other managers, and was also a frequent manager of opera and concert companies on his own responsibility. Under his management many well-known singers were introduced in New York. He was the first American manager of Mme. Parepa, before she was married to Carl Rosa. Wachtel and Carlotta Patti appeared in the U. S. under his management, and the tragic actors Salvini and Mme. Ristori also made their earliest American tours directed by him. In 1883 he went to Australia, but soon returned. D. in New York, Aug. 11, 1898. D. E. H.

Dewar, JAMES, M. A., F. R. S., F. R. S. E.: chemist; b. in Kincardine-on-Forth, Scotland, in 1842: graduated at the University of Edinburgh, and continued his study of chemistry there as assistant to Sir Lyon Playfair. Later, he went to Ghent to study with Prof. August Kekulé. After holding several comparatively unimportant positions, he became Jacksonian Professor of Natural Philosophy in the University of Cambridge and Fullerian Professor of Chemistry in the Royal Institution of Great Britain. His most noteworthy work has been done in connection with his researches into the behavior of gases under great pressures at temperatures approaching the absolute zero. In 1886 he liquefied oxygen and solidified nitrogen and air, and in 1897 he succeeded in liquefying fluorine, an element so elu-

sive that its characteristics had never been accurately observed until he reduced it to an inert liquid. Besides reports on liquefied gases, Prof. Dewar published *The Oxidation Products of Picoline*; *Specific Heat of Carbon at High Temperatures*; *The Physiological Action of Light*; *Spectroscopic Investigations*; and many other papers.

Dewey, John, Ph. D.: educator; graduated at the University of Vermont 1879; fellow Johns Hopkins University 1883–84; Ph. D., Johns Hopkins, 1884; instructor and assistant professor in philosophy, University of Michigan, 1884–86; Professor of Philosophy, University of Minnesota, 1888–89; Professor of Philosophy, University of Michigan, 1889–94; head Professor of Philosophy and Pedagogy, University of Chicago, since 1894. He is the author of a *Psychology*, *Psychology of Numbers* (with J. A. McLellan), and of numerous philosophical and educational essays. C. H. T.

Dexter, Henry: sculptor; b. in Nelson, N. Y., Oct. 11, 1806. Early in life he was apprenticed to a blacksmith, in Pomfret, Conn., where he also worked on a farm; excelling as a worker in metals, he determined to become an artist, and first essayed portrait-painting in Providence, R. I.; moved to Boston in 1836, and afterward to Cambridge, where the remainder of his life was spent. He began the study of sculpture in 1840, and thenceforth confined himself to that art. It is said that he never saw a sculptor model in clay or chisel the marble until years after he became master of the art. His portrait busts, numbering in all more than 200, were specially successful productions, among them being busts of Agassiz, Anson Burlingame, Longfellow, Dickens, and Henry Wilson. Some of his most noted statues are *The Backwoodsman*, *Gen. Joseph Warren at Bunker Hill*, and *Nymph of the Ocean*. His *Binney Child*, in Mt. Auburn cemetery, is claimed to be the first marble statue executed in America. He persistently refused to go abroad for study, holding that artists who did so, while gaining no finer inspiration, lost their distinctive Americanism. D. in Cambridge, Mass., June 23, 1876.

Dhanis, dăă′nċē′, Baron François: Belgian army officer; b. in London, Mar. 11, 1862; received his early education in Scotland; graduated at the military school of Belgium in 1884, and was assigned to the infantry service with the rank of lieutenant. In 1884 he went to the east coast of Africa as a member of the fifth expedition of the International African Association. In 1886 he began his service in the Congo Free State, where he still remains (1899). He explored the Koango river and some of its tributaries, established a number of stations, organized the government of the new province, and his organizing ability and energy led to his employment in organizing some of the provinces on the far upper Congo. Since early in 1892 he has been commander-in-chief of the military forces in the field, in which capacity he directed the entire campaign of 1892–93 against the revolting Arab slave and ivory dealers of the upper Congo, who attempted to exterminate the whites because the Free State prohibited them from extending their slave raids farther down the river. The campaign lasted twenty months, and a considerable number of desperate battles were fought, in which the Arab losses were very severe. Dhanis drove them first out of their stations on the upper Congo for a distance of 400 miles above the confluence of the Congo and Lomami rivers, and then forced them east through Manuema to Lake Tanganyika and out of the Congo State. The result of this brilliant campaign was to crush utterly the Arab influence and put an end to slave-raiding throughout the State's domain. C. C. A.

Dicey, Albert Venn, M. A., B. C. L., LL. D.: English jurist; b. in England in 1835; took his degree at Oxford University and was called to the bar at the Inner Temple in 1863; was appointed public examiner in jurisprudence 1874–75, and Vinerian Professor of English Law at Oxford University in 1882; his publications include *The Privy Council*, an essay (1860; 2d ed. 1887); *Treatise on Rules for Selection of Parties* (1870); *The Law of Domicil* (1879); *England's Case against Home Rule* (1886). F. S. A.

Dignities: in English law, titles of honor, considered as incorporeal hereditaments. Formerly, in Great Britain, dignities were annexed to territorial property rather than to the person, and alienation of the land carried the dignities with it; but they are now strictly personal, descending to the heir in the patent whereby they are granted, and not being transferable by voluntary alienation, or attachable for debt. In the classification of dignities as superior and inferior the names of baronet, knight, etc., designate the inferior dignities. No temporal dignity of any foreign nation can give to a man a higher title than that of esquire in Great Britain; in the U. S. titles of nobility can not be granted by either State or Federal Government (Constitution, Art. I., Sec. 9, cl. 8; Sec. 10, cl. 1), and all titles of dignity must be renounced by alien applicants for admission to citizenship (U. S. Rev. St., Sec. 2165). F. S. A.

Dillon, John Forrest, LL. D.: b. in Northampton, N. Y., Dec. 25, 1831; when seven years of age removed with his parents to Davenport, Iowa; attended the public school in Davenport, and later entered the medical department of Iowa University, where he graduated, and practiced medicine for six months; entered into business as a druggist; studied law and was admitted to the bar in 1852; was elected in 1858 judge of the seventh judicial district of Iowa, and at the expiration of his term was re-elected; during that time he prepared his digest of *Iowa Reports*; became by election justice of the Supreme Court of the State in Jan., 1863; re-elected in 1869, but before qualification was appointed by President Grant judge of the U. S. circuit court for the eighth judicial circuit, embracing the States of Iowa, Minnesota, Nebraska, Missouri, Kansas, Arkansas, and later Colorado. He founded and for one year edited the *Central Law Journal*, and wrote *Municipal Bonds* (1876); *Municipal Corporations* (1872); *Laws and Jurisprudence of England and America* (1891–92); prepared *U. S. Circuit Reports*, in five volumes (1871–80); in Sept., 1879, removed to New York city to accept a professorship of real estate and equity jurisprudence in Columbia College Law School, and a position of general counsel to the Union Pacific Railroad Company; in 1882 resigned his professorship in Columbia College. He was one of the commissioners appointed to draw up the charter of greater New York (1891–92); was Storrs Professor of Municipal Law in Yale University; in 1892 was elected president of the American Bar Association. F. Sturges Allen.

Dilolo, Lake: a small lake on the south border of the Congo Free State, Africa (about 12° S. lat., and 22° E. lon.), 4,000 feet above the sea, and so exactly balanced on the water parting between the Congo and Zambesi systems that one affluent carries a part of its waters to the Kassai branch of the Congo, while another flows to the Liba head-stream of the Zambesi. This discovery by Livingstone in 1853 proved that the Congo and the Zambesi form a continuous water-course across the continent, and placed Dilolo among the small number of lakes that send their waters to two different water-systems. C. C. Adams.

Dingley, Nelson: statesman; b. in Durham, Me., Feb. 15, 1832; graduated at Dartmouth College in 1855; studied law and was admitted to the bar, but never practiced his profession. In 1856 he bought the *Lewiston Journal*, and under his management it soon became an important Republican paper of wide influence. In 1861 he was sent from Auburn as Representative to the State Legislature, was re-elected in 1862, and in 1863 was chosen Speaker of the House. Later he was again sent from Lewiston as Representative and again chosen Speaker. In 1873 he was elected Governor, was re-elected in 1874, and declined nomination the following year. From 1872 to 1881 he was prominent in Republican politics, in 1881 was elected to Congress, and was re-elected eight times successively. He helped frame the McKinley tariff of 1890, and was an earnest opponent of the Wilson Bill of 1894. In 1897 the ways and means committee, under his leadership, framed the tariff bill commonly called the Dingley Bill. D. in Washington, D. C., Jan. 13, 1899.

Dionne, Narcisse Eutrope, M. D.: author; b. in St. Denis de la Bouteillerie, Quebec, Canada, May 18, 1848; educated at the College of Ste.-Anne, studied theology, and studied medicine at Laval University; practiced at Stanfold, Quebec, a few years, and then abandoned medicine for literature and journalism. Among his publications are *Le Tombeau de Champlain* (1880); *Les Cercles Agricoles dans la Province de Québec* (1881); *États-Unis. Manitoba et Nordouest* (1882); *Histoire de l'église de Notre Dame des Victoires* (1888); *Jacques Cartier* (1889); *La Nouvelle France—De Cartier à Champlain* (1891); *Samuel Champlain* (vol. i., 1891); *Vie de C. F. Painchaud* (1894).

Doane, Thomas: civil engineer; b. in Orleans, Mass., Sept. 20, 1821; connected as engineer with many railroads, but particularly identified with the Boston and Maine road;

chief engineer of the Hoosac tunnel; introduced nitroglycerine and electric blasting in the U. S., invented machinery for compressed air, and participated in the invention of pneumatic drills. He went to Nebraska in 1869, and while there aided in the establishment of Doane College, for the site of which he secured a square mile of ground at Crete, 20 miles E. of Lincoln. He returned in 1873 as consulting engineer to the Hoosac tunnel, and ran the first locomotive through it, Feb. 9, 1875. He was president of the Boston Society of Civil Engineers. D. in West Townsend, Vt., Oct. 22, 1897.

Dodge, Charles Richards: b. in Covington co., Miss., July 17, 1846; studied agriculture in the Sheffield Scientific School of Yale University in 1865–67, after which he entered the Department of Agriculture as assistant entomologist and was placed in charge of the museum of the department, beginning at that time his study of textile fibers. He prepared the exhibit of agricultural products, birds, and insects for the Department of Agriculture that was sent to the Centennial Exhibition in Philadelphia in 1876. A year later he resigned from the Department of Agriculture and became editorially connected with the magazine *Outing*, and also contributed on agricultural topics to various magazines and journals. He served on the tenth census as an expert in agriculture, and in 1890 was again called to the Department of Agriculture to fill the place of chief special agent of the office of fiber investigations. He represented the Agricultural Department at the exposition in New Orleans in 1885, and later aided in the preparation of the agricultural exhibit of the U. S. for the World's Fair held in Paris in 1889, where he was the technical expert in agriculture from the U. S., serving also on the jury of awards. He was officially connected with the World's Fair held in Chicago in 1893, where he was also a juror, and he directed the preparation and installation of the entire exhibits of the Department of Agriculture at the Cotton States Exposition, held in Atlanta in 1895, at the Tennessee Centennial Exposition, held in Nashville in 1897, and at the Trans-Mississippi Exposition, held in Omaha in 1898, at all of which he also served on the juries of awards. In 1899 he was appointed director of agricultural exhibits for the commissioner general of the Paris Exposition to be held in 1900, and is also the representative of the Secretary of Agriculture in that connection. Mr. Dodge is a fellow of the American Association for the Advancement of Science, and a member of other scientific societies, and in 1889 received the order of agricultural merit from the French Government. His publications include more than twenty official papers which relate to textile fibers, and of these the most important is his *Dictionary of the Fibers and Fiber Plants of the World* (Washington, 1897). Marcus Benjamin.

Dodge, Richard Elwood, A. M.: educator; b. in Wenham, Mass., Mar. 30, 1868; educated in Salem, Mass., high school and Harvard University; A. B., Harvard, 1890; A. M., Harvard, 1894; assistant in geology, Harvard University, 1891–94; instructor in geology, Harvard University, 1894–95; instructor in geology and geography, Teachers College, New York, 1895–96; associate Professor of Natural Science, Teachers College, 1896–97; Professor of Geography, Teachers College, since 1897; author of various scientific and educational papers; editor of *The Journal of School Geography*.

Dodge, Theodore Ayrault, LL. B.: soldier and author; b. in Pittsfield, Mass., May 28, 1842. Having received a military education in Berlin, he studied at University College, London, and at Heidelberg; received the degree of LL. B. from Columbia College in 1866. During the civil war he served in the Army of the Potomac, losing a leg at Gettysburg; rose to major of volunteers 1864; was breveted colonel in the same year; was made captain in the Forty-fourth U. S. Infantry 1866, and was breveted lieutenant-colonel U. S. Army; after serving as chief of a bureau in the War Department, was retired in 1870. His principal publications are *Chancellorsville* (1881); *A Bird's-eye View of our Civil War* (1883); *A Chat in the Saddle* (1885); *Great Captains* (1889); *Alexander* (1890); *Hannibal* (1891); *Cæsar* (1892); and *Riders of Many Lands* (1893).

Doe, Charles: jurist; b. Apr. 11, 1830; graduated at Dartmouth College in 1849; studied law at Harvard Law School, and after his admission to the bar practiced law at Dover, N. H.; was county solicitor for several years, assistant clerk and clerk of the Senate of New Hampshire; was appointed judge of the supreme judicial court Sept. 23, 1859; held this office until legislated out of it by a change in the court in 1874; was appointed chief justice of the Supreme Court July 22, 1876, and retained his office until his sudden death on his way to attend a law term of the court, Mar. 9, 1896. He was for thirty-four years a member of the court of final jurisdiction of the State, and during this time exercised a commanding influence over his associates. He was an advocate of reform in methods and procedure, and to him was due much of the reform in common-law pleading in the State which has given to the practice the flexibility of the practice of the code States without the hampering statutory restrictions. F. Sturges Allen.

Doolittle, Edwin Stafford: artist; b. in Albany, N. Y., in 1843. He opened a studio of painting in New York city in 1867, and in the following year went abroad, studying chiefly in Rome until compelled to return by failing health. His *Shadow of a Great Rock in a Weary Land*, of which he made several copies, was painted in 1869. His landscape and marine subjects include *Sunset on an Adirondack Swamp*: *Chimney Rock, North Carolina*; *Gray's Peak, Colorado*; *A Pool in the Warwick Woodlands*; *Ruins of the Claudian Aqueduct on the Roman Campagna*; *On the Giuadecca Canal, Venice*; *The Arch of Titus*; *Autumn in the Catskill Clove*; *The Oxenstrasse, Lake Lucerne*; *The Toll-gate*; and *Sunset on Schroon Lake*. His illumination of *A Prayer to the Virgin* is in the Convent of the Sacred Heart, at Savannah, Ga., and that of *The Soliloquy of Friar Pacificus*, done for the Centennial Exhibition at Philadelphia, was afterward presented to Longfellow. D. about 1880.

Doolittle, James Rood: jurist and U. S. Senator; b. in Hampton, Washington co., N. Y., Jan. 3, 1815; educated at Middlebury Academy and Geneva (now Hobart) College; admitted to the bar in 1837; elected district attorney of Wyoming co., N. Y., in 1845; went to Wisconsin in 1851, was elected judge of the first judicial circuit of that State in 1853, and represented Wisconsin in the U. S. Senate 1857–69, serving as chairman of the committee on Indian affairs and on other important committees. He was a trustee of Chicago University, was its president for one year, and for many years a professor in its law school. D. in Edgewood, R. I., July 27, 1897.

Dörpfeld, dörp'felt, Wilhelm, Ph. D., LL. D.: architect and archæologist; b. at Barmen, near Düsseldorf, Dec. 26, 1853; studied at the Bauakademie in Berlin; employed as assistant for the excavations at Olympia 1877–81; appointed assistant in the German Archæological Institute at Athens 1882; associated for several years with Heinrich Schliemann in his excavations, notably at Tiryns and Troy; second secretary of the German Institute at Athens 1886; first secretary since 1887; co-editor of *Ausgrabungen zu Olympia* 1877–81, and of later editions of *Troja* 1884–93; author of numerous articles in the *Mittheilungen des arch. Inst. zu Athen*. His chief work is *Das griechische Theater* (with Emil Reisch, 1896). He is the greatest living investigator and interpreter of Greek architecture; distinguished by his power of insight and practical sense as an investigator, and by his clearness of statement and logical force as a writer and lecturer. Benj. Ide Wheeler.

Dorr, Julia Caroline (*Ripley*): author; b. in Charleston, S. C., Feb. 13, 1825; went with her father to Vermont in 1830, where she married. She contributed to *Sartain's Magazine* 1848, taking one of its hundred-dollar prizes by her first story, *Isabel Leslie*. Her publications include *Farmingdale*, a novel, issued under the pseudonym of *Caroline Thomas* (1854); *Lanmere*, a novel (1856); *Sibyl Huntingdon*, a novel (1869); *Poems* (1871); *Expiation*, a novel (1872); *Friar Anselm, and other Poems* (1879); *Daybreak, an Easter Poem* (1882); *Bermuda* (1884); *Afternoon Songs* (1885).

Douls, dool, Camille: African explorer: b. in Bordes, France, in 1864. After qualifying himself by the study of Arabic and the manners of Saharan tribes, he induced a Canary Island fishing-boat in 1886 to land him on the west coast of Africa, between Cape Bojador and the Rio de Oro, S. of Morocco. Disguised as a Mussulman, he was left alone with his scanty stores. The nomads whom he first met proved to be the terrible Ulad Delim, the robbers of the western Sahara. They made him captive and maltreated him, but his knowledge of the Koran and Mohammedan forms of worship saved his life, and he gradually won the confidence of his captors, with whom he wandered for five months over unexplored steppes. He reached the limit of the desert of Uarau and El Juf, the great depression

of the Sahara, only 500 feet above the sea. His compass and barometer were returned to him, and he was able to make some interesting observations. Turning north again, he visited Tenduf, the great slave-market of the north Sahara. When near Morocco he escaped from his nomad friends and made his way through that country to Europe. His route was through wide tracts of country previously unknown, and he brought back much information important alike to geography and ethnology. The Paris Geographical Society printed an account of his journey. He started from Paris in June, 1888, to renew his explorations, and is believed to have been on his way to Timbuctoo when he was murdered by his guides between the oases of Alouef and Akabli, about 550 miles S. of Oran. C. C. Adams.

Driver, Samuel Rolles, D. D.: Church of England scholar; b. in Southampton, England, Oct. 2, 1846; had a brilliant career at Oxford, where he received his B. A. degree 1869 and M. A. 1872. He succeeded the Rev. Dr. Pusey as Professor of Hebrew and Canon of Christ Church, Oxford, in 1882. He was a member of the Old Testament revision company. His best-known books are his *Treatise on the Use of the Tenses in Hebrew* (Oxford, 1874: 3d ed. 1892); *Notes on the Hebrew Text of the Books of Samuel* (1890); *Introduction to the Literature of the Old Testament* (1891; 6th ed. 1897), in the International Theological Library, Edinburgh and New York, and the commentary on *Deuteronomy* (1895) in the International Critical Commentary, Edinburgh and New York. S. M. J.

Drumgoole, John Christopher: Roman Catholic priest; b. near the town of Granard, County Longford, Ireland, Aug. 15, 1816; taken to New York city in 1824; became a shoemaker, but in 1844 sexton of St. Mary's Catholic church, and in 1850 part owner of a small book-store. It had long been his ambition to become a priest, but it was not until 1863 that he entered upon his studies. These were carried on at St. Francis Xavier College in New York city, at St. John's College, Fordham, New York, and at the Seminary of Our Lady of Angels, Suspension Bridge, New York. At length he was ordained priest, May 24, 1869, and was assigned to St. Mary's, New York city. In 1871 he became superintendent of a lodging-house for destitute and homeless boys in the city, and the work prospered under his management so that enlarged accommodations were soon required. It also changed character. In 1881 the present building on the corner of Great Jones Street and Lafayette Place was opened. His statue now stands in front of it. The work is known as "The Mission of the Immaculate Virgin for the Protection of Homeless and Destitute Children." It is for the care, maintenance, and secular and religious education of homeless and destitute children of both sexes without distinction, and to teach them habits of industry and self-reliance. Children from four to fifteen years of age, whether committed by the courts or by relatives and guardians, are received in the Lafayette Place building, and in most cases are transferred to the country branch, which is at Mt. Loretto on Staten Island, in the buildings erected in 1883, which are thoroughly equipped for instruction in the various branches of manual and industrial training and can accommodate 1,200 boys and 150 girls. On the Staten Island property there is an asylum for blind girls under fourteen years of age. The Lafayette Place building is also a temporary home for healthy non-criminal boys from sixteen to twenty years old, whether Roman Catholics or not, who are out of work, and a boarding-house at $2 a week for newsboys, bootblacks, and other working boys able to pay. These are all instructed spiritually and mentally. Of these latter classes the home can accommodate 350. Father Drumgoole was the author of this extensive programme of usefulness, and his spirit animated the work. D. in New York city, Mar. 28, 1888. The money of the city and private contributions support the work. S. M. J.

Dufile, du-fē'le: the chief port for steamers on the upper Nile (lat. 3° 40′ N., lon. 32° 5′ E.), in the old equatorial province of Egypt. There is uninterrupted navigation between Albert Nyanza and Dufile, about 150 miles by the river to the N. N. E., but navigation is impeded by rapids about 20 miles below Dufile. It is situated in the Madi country, which is a rich agricultural district near the big bend of the Nile, where the river suddenly turns to the N. W. Four right and two left tributaries converge toward the town. These facts promise to give much commercial importance to Dufile. Emin Pasha was particularly proud of this station, which he did much to develop. C. C. A.

Dupuis, dü'pwee', Nathan Fellowes, M. A.: scientist; b. in Portland, Ontario, Apr. 13, 1836; graduated at Queen's University, Kingston, in 1866; has been a professor in Queen's University twenty-eight years, first of Chemistry and Natural Science, then of Mathematics; is a Fellow of the Royal Society of Canada, to whose *Transactions* he has contributed a number of papers; is editor of the *Canadian Educational Monthly*. His works include *Elements of Geometrical Optics* (1868); *Junior Algebra* (1882); *Geometry of the Point, Line, and Circle in the Plane* (1889); *Principles of Elementary Algebra* (1893); *Elements of Synthetic Solid Geometry* (1893).

Dy'ea, or **Taiya** [Indian word meaning pack or load]: an Alaskan coast settlement at the head of Dyea Inlet, Lynn Canal (see map of Alaska, refs. 4–H and 2–H). Here begins the Dyea or Chilkoot Pass route to the head-waters of the Yukon. The trail over Chilkoot Pass has been used by the Indians for generations, and until 1897 it was practically the only overland route followed by miners to the Yukon goldfields. At the head of Dyea Inlet are extensive shoals, and ocean vessels discharge their cargoes by lighters or upon a rocky point a mile from the settlement, to which they are carried by wagons. The trail over the pass (3,500 feet above the sea) is difficult, but the distance to Lake Bennett, beyond the pass, is only about 30 miles; and from this lake there is a waterway of 548 miles, through lakes, rapids, and rivers to Dawson, in the Klondike district. The population of Dyea is mostly transient, and varies from a few hundred to several thousand. C. C. Adams.

Earle, John: philologist; b. in Elston, England, Jan. 29, 1824; received education at the Plymouth New Grammar School and at the Grammar School at Kingsbridge; entered Oxford 1842; was in the first class of Litteræ Humaniores 1845 and took his B. A.; was elected fellow of Oriel; took the degree of M. A. 1849, and became Professor of Anglo-Saxon; was ordained deacon 1849; became college tutor 1852; was presented by Oriel to the rectory of Swanswick 1857; appointed to the prebend of Wanstrow 1871; made rural deacon of Bath 1873; became Professor of Anglo-Saxon in the University of Oxford 1876. His chief publications are *Gloucester Fragments* (1861); *Bath, Ancient and Modern* (1864); *Two of the Saxon Chronicles Parallel* (1865); *The Philology of the English Tongue* (1871; 5th ed. 1892); *A Book for the Beginner in Anglo-Saxon* (1877; 3d ed. 1884); *English Plant-names from the Tenth to the Fifteenth Century* (1880); *Anglo-Saxon Literature* (1884); *English Prose: its Elements, History, and Usage* (1890); *The Psalter of 1539: a Landmark in English Literature* (1894); and *A Simple Grammar of English Now in Use* (1897).

Ecuador: The Government expects to continue to Sibambe the railroad now in operation from Duran to Chimbo. The great disadvantage under which the country labors owing to the lack of wagon-roads or railroads is shown by the fact that, though fine wheat is grown in the higher and cooler regions, all the wheat and flour consumed in the coast regions is brought from San Francisco and Chili, as the freightage from these points costs less than transportation by mule-back from the interior. The U. S. sends larger quantities of goods, but the imports from Great Britain and France are of higher aggregate value. There is a good market for foreign manufactures if they are cheap, which is an all-important consideration. C. C. Adams.

Edkins, Joseph, D. D.: sinologue; b. at Nailsworth, Gloucestershire, England, Dec. 19, 1823. He took his B. A. degree in London University in 1843, in 1848 became a missionary in China in connection with the London Missionary Society, and so continued until 1880, when he entered the Chinese imperial maritime customs service as translator into Chinese of scientific and other books. In 1885 he retired. His works include numerous translations into Chinese, aids to the study of Chinese—*Grammar of the Shanghai Dialect* (Shanghai, 1853); *Grammar of the Mandarin Colloquial Language* (1857; 2d ed. 1863); *Progressive Lessons in the Chinese Language* (1862; 4th ed. 1886); *Introduction to the Study of the Chinese Characters* (1876)—and studies of the Chinese—*Religion in China* (1859; 3d ed. 1884); *Chinese Buddhism* (1880). S. M. J.

Edmunds, Lewis Humfrey, M. A., LL. M., D. S. C.: patent lawyer; b. about 1860; studied at University College School, London, St. John's College, London, and was called to the bar in 1884; was appointed queen's counsel 1895;

he has paid special attention to the subject of patents, copyrights, and trademarks, and his publications on these subjects include *Law and Practice of Letters Patent for Inventions* (2d ed. 1897); *Copyright in Designs* (1895); *Patents, Designs, and Trade Marks Acts Consolidated*, and other articles and brochures on taxation of inventors, electric lighting, rejection of hearsay evidence, registration of designs, etc.; was a member of Parliament in 1886.

F. Sturges Allen.

Edwards, Julian: composer; b. in Manchester, England, Dec. 17, 1855, and studied music under Sir George A. Macfarren and Sir Herbert S. Oakley. He was appointed pianist to the Carl Rosa Opera Company, and later became conductor of the Royal English Opera Company. He composed an opera entitled *Victorian*, the libretto being adapted from Longfellow's dramatic poem *The Spanish Student*. This was produced at Covent Garden, London, in Jan., 1884. He came to New York in 1888, and has since written a number of operas and operettas, including *Jupiter* (1892); *Friend Fritz* (1893); *King René's Daughter* (1893); *Madeline, or the Kiss* (1894); *Brian Boru* (1896); *The Wedding Day* (1897), besides a large number of songs and concerted vocal music.

D. E. Hervey.

Effort: The sense or feeling of effort has become, in recent discussion, one of the most important topics of psychological interest. Effort began to be discussed by the Scottish psychologists, especially Reid, who found in it direct evidence of a spiritual principle or soul. This lead was taken up and followed out by certain French philosophers—Royer-Collard and Maine de Biran—who developed the view that in the experience of mental effort we become aware of a kind of activity, a sort of personal expenditure of spiritual force, which is without analogy in external nature, and on the basis of which we reach our ideas of cause and activity in the world of mechanical fact. In psychology, the gauntlet was thrown down to this view by several writers at about the same time, all of whom took the psychological form of the effort theory as advocated by Prof. Wundt, of Leipzig, as their object of attack. Bastian and Ferrier in England, James in America, followed by Münsterberg in Germany, contended that the sense of effort was itself a complex of sensations, coming in from the muscular and vaso-motor systems, and that, in making an effort, instead of putting forth a mysterious form of mental energy, we are feeling the reverberation of earlier sensations of movement (kinæsthetic sensations) as they are brought up into a new sensational determination by the conditions of a new action. These writers made out so good a case and furnished so finished and truthful an analysis, that the opinion had steadily gained ground, until Prof. Wundt and many others of the advocates of the *sui-generis* view of mental effort have gone over to the so-called kinæsthetic view.

In weighing the matter, however, we should distinguish carefully between the psycho-physical and the epistemological questions. If it be true that every mental change and condition has its brain-state, and that changes in consciousness are accompanied by brain-changes, then, strictly from the psycho-physical point of view, it is merely a matter of fact as to what sort of physical action goes on when the sense of effort occurs; whether it be a feeling of incoming sensations, kinæsthetic in their origin, and memories of these, or whether it be outgoing discharges from the brain. In other words, it does not matter as to whether it be sensations, memories, or what, that we have in consciousness when we feel effort. Let there be a spiritual activity putting forth some form of force of its own, still, if the psycho-physical point of view be justified at all, we should expect to find certain nervous sensational processes going on in the brain just the same. To discover these processes, and to show that the state of mind called effort is a complex of these elements, is only to give a scientific illustration of the truth of psycho-physical parallelism. The epistemological question, on the other hand, still remains unanswered—the question of the value and meaning of the sense of effort in a theory of knowledge. If it be true, as many hold, that the idea of cause grows up on the basis of the sense of effort, and that our belief in activity in the external world is conditioned upon and derived from our belief in our own active effort, then we must either give up all activity, all causation, the validity altogether of some of the categories of knowledge, or, on the other hand, admit the essential contention of those who hold that sense of effort is primary for our knowledge, and irreducible to anything else.

In other words, it is not necessary, in the interests of a spiritual or idealistic philosophy, to deny thoroughgoing parallelism, nor to refuse to make thoroughgoing psychological analyses. Effort is a psycho-physical fact. The epistemological and philosophical interpretations of the facts are still open, and they become only richer and more secure by the details of scientific fact which psychological analysis furnishes.

Literature.—Bain, *Senses and Intellect* (4th ed.); Wundt, *Physiologische Psychologie* (4th ed.); Mach, *Die Bewegungsempfindungen*; Waller, *Brain* (1891, p. 179); James, *Principles of Psychology* (11, p. 480); Bastian, *Brain as the Organ of Mind*; Münsterberg, *Die Willenshandlung*; Ward, *Psychology*, in *Encyclopædia Britannica*.

J. Mark Baldwin.

Egbas: one of the large tribes of the Yoruba country, which, next to the lower Nile valley, is the most densely peopled part of Africa, extending from the Gulf of Guinea about 200 miles N. between Dahomey and the Niger watershed. The Egbas, like the kindred tribes, are described as a gentle, kindly, and hospitable people. Their chief occupation is agriculture, but in their large towns along the Ogun river they have many industries, including weaving and leather manufactures.

C. C. Adams.

Egga: a large town and the most important trade-center of the Abuja country, on the right bank of the Niger river, West Africa, about 70 miles above its confluence with the Benue. It is inhabited largely by Fulahs, is a collecting-point for the commodities of a wide region, and the town and territory form part of the domain of the Royal Niger Company of England. Its situation is in a swampy, malarious district.

C. C. Adams.

Eggs: The production of eggs for market from the domestic fowl is one of the greatest of the smaller industries. The number of hens in Great Britain is far too small to supply the demand for eggs, and in 1895 more than 1,526,000,000 eggs, worth more than $20,000,000, were imported. In 1896 Germany imported about 1,520,000,000 eggs. The reason why Germany does not produce enough eggs for her own consumption is on account of excessive dampness causing large mortality among young chickens, and also because large districts are occupied by extensive estates where the peasantry live in villages, which prevents the keeping of large numbers of flocks. Forty per cent. of the eggs consumed in Great Britain are from abroad, and 90 per cent. of those handled by merchants in Great Britain and Germany are foreign. In 1894 the consumption of imported eggs per head in Germany was 30, and in Great Britain 37. The chief hen countries of Europe are France, Austria-Hungary, Russia, Italy, Belgium, and Denmark. Russia exported 1,475,000,000 eggs in 1896. China contains more fowls than any other part of the world. Eggs are much used in Japan, but being much cheaper in China, are almost all imported from that country. Nearly all the eggs produced in the U. S. are consumed at home, and the value of all the U. S. poultry products in 1880, $200,000,000, was equal to the value of all the dairy exports in a single year up to the census report of 1890.

C. C. Adams.

Egypt: The census of 1897 shows a total population of 9,734,405, of whom the agricultural element (Fellaheen) forms 61 per cent.; 8,978,775, or over 92 per cent., are Moslems, and of the 730,162 Christians, 608,446 are Copts. The population of the leading cities is: Cairo, 570,062; Alexandria, 319,766; Tannah, 57,289; Port Saïd, 42,695; and Assiut, 42,012. Only 4.8 per cent. of the inhabitants can read and write. Jan. 1, 1899, there were 10,000 schools, with 16,500 teachers and 220,000 pupils. Seven-eighths of the schools are elementary, giving instruction only in reading, writing, and the rudiments of arithmetic. Egypt has prospered under the tutelage of Great Britain. Within the ten years ending in 1898 the annual revenue has been increased by $7,500,000, though taxes have been remitted to the extent of $5,000,000. In fifteen years the population has increased over 2,500,000. Production and commerce also have steadily advanced. The imports in 1899 were valued at $55,442,689.92, of which Great Britain supplied about one-third, Turkey one-fifth, and America $1,160,819.06. The exports in the same year were valued at $75,884,481.25, of which Great Britain took about one-half, Russia one-tenth, France and Algeria one-tenth, and America $6,653,441.12, mostly cotton. The U. S. buys more and more of the long-fibered Egyptian cotton every year, and it is regarded as indispensable in some branches of manufacturing. It is the chief export crop of Egypt.

In Jan., 1899, there were 1,166 miles of railroad owned and worked by the state and 72 miles owned by private companies, 825 miles in the Delta and 413 miles in Upper Egypt. All the railroads are profitable, but the income of the Government roads is pledged to European creditors for debts incurred by Ismail Pasha. The long-discussed enterprise of damming the Nile in order to store the large volume of water that runs to waste during the flood period and reserve it for the months of the low Nile was begun late in 1898, and the corner-stone of the great dam at Assouan, 800 miles from Alexandria, was laid in Feb., 1899. The dam will be a mile and a quarter long, 40 feet wide, and 70 feet high, and in the three summer months of flood it will retain an immense volume of water, which is expected to give the country below all the water it needs during the winter and spring. It is believed that the Nile for 140 miles above the dam will feel the influence of this impounding of waters. The amount of water that will accumulate in this reservoir is estimated at 255 billion gallons. Much land will be reclaimed from the desert, but this is not the chief efficiency claimed for the dam. It is expected to secure sufficient water to irrigate the fields throughout the year, and thus make it possible to raise two crops annually where only one is now produced. It is believed in particular that cotton-growing with the aid of this surplus water will be extended much farther up the Nile. The top of the dam will serve as a bridge. It will be built of granite from the Assouan quarries. In order to prevent the submerging of the two beautiful temples to Isis on the neighboring island of Philæ, a calamity against which archæologists most emphatically protested, the engineers finally modified their plans, and the dam will be one-third lower than was at first proposed. The enterprise is backed by British capital and is expected to cost $25,000,000, which will be paid by the Egyptian Government in yearly installments extending over thirty years. The dam will be supplemented by a barrage at Assiut, 330 miles farther down the river, which is intended to keep the level of the Nile at that point about 10 feet higher than the mean level, so that it will be possible at all seasons to divert the water there into the Ibrahimia canal, and thus distribute it far north among the fields on the west side of the Nile. The dam and barrage will not interfere with navigation, as locks will be built in which vessels may be raised or lowered to the differing levels.

The campaign begun in 1896 for the reconquest of the Egyptian Sudan, which had long been under the control of the Mahdi and his successor the Khalifa Abdullah-el-Taaisha, was pursued until the capture of Omdurman on Sept. 2, 1898, after a terrible battle in which half the Khalifa's force was killed or wounded and he saved himself only by flight into Kordofan with a few followers. The military operations, which were conducted throughout by the Sirdar Sir H. H. Kitchener (Lord Kitchener of Khartum, 1898) with the Egyptian army and a small force of British troops, were much facilitated by the building of a military railroad across the desert from Wady Halfa to Abu Hamed, thence up the Nile to the confluence with the Atbara. In 1899 it is being extended to Khartum, and its further extension to Fashoda has been authorized. Kassala, N. W. of Abyssinia, which had for some years been held by Italy, was restored to Egypt in Dec., 1897. Egypt has now reoccupied her Sudan provinces as far E. as Kassala and as far S. as Fashoda on the Nile. The country is under the control of Gen. Lord Kitchener as administrator, and he is authorized to enforce any regulations he may think proper to promulgate as the law of the land. He found at Fashoda Major Marchand, a French officer, with 130 men, who declined to surrender Fashoda, on the ground that the French Government had instructed him to hold the upper Nile to that point. In November, however, France decided to relinquish Fashoda. On the whole, the reoccupancy of the Sudan by Egypt has been received with acclamation by the tribes whom Kitchener has met. It is believed that the population of the Sudan, estimated in 1885 to be 12,000,000, is not more than 4,000,000 or 5,000,000 in 1901. C. C. Adams.

Ehninger, John Whetton: artist; b. in New York city, July 22, 1827. After graduating at Columbia College 1847, he studied art in Paris 1848–49, going abroad again 1851–52, visiting Düsseldorf and other art-centers. He illustrated with etchings Hood's *Bridge of Sighs*, Irving's *Dolph Heyliger*, and Longfellow's *Miles Standish*. His best-known paintings include *Peter Stuyvesant*, *A New England Farmyard*, *The Yankee Peddler*, *The Foray*, *Lady Jane Gray*, *Christ Healing the Sick*, *Vintage in the Valrella*, and *Twilight from the Bridge of Pau*. D. in Saratoga, N. Y., Jan. 22, 1889.

Eichwald, īch'vaălt, Edward: naturalist of German extraction; b. at Mitau, Russia, July 4, 1795. He visited the Caspian Sea and Persia, and became Professor of Mineralogy and Zoölogy at St. Petersburg in 1838, after which he made scientific excursions to several parts of Russia and Italy. Among his works are *Travels to the Caspian Sea and the Caucasus* (1834); *Fauna Caspio-Caucasia* (1841); *The Primitive World in Russia* (4 vols., 1840–47); and *The Palæontology of Russia* (1851). D. in St. Petersburg, Nov. 10, 1876.

Eider, ī'der (Lat. *Eidera*): a river of Germany, forming the boundary between Schleswig and Holstein; rises about 10 miles S. W. of Kiel, flows nearly westward, and enters the German Ocean at Tönning. It is about 90 miles long, and is navigable from its mouth to Rendsburg. A canal cut from Rendsburg to Kielfiord opens a communication from the Baltic to the North Sea.

END OF VOLUME THREE.